The Physiotherapy Review

Volume 23 Number 5

Table of Contents

	Page
Practical Application of the Kenny Principles in the Management of Acute Anterior Poliomyelitis—George L. Dixon, M.D., and Dorothy A. Graves, B.E., R.P.T.T.	195
Reciprocal Action Skills in the Treatment of Cerebral Palsy—Robertine St James, R. P. T. T.	199
Progressive Relaxation in Physical Therapy: II. Summary for Student Technicians—Anna Wetterhuus and Bernadine Lufkin	201
Relearning to Walk—Mildred F. Heap	208
Schools Approved for Training Physical Therapy Technicians	210
Editorials	212
Index to Current Literature	218
Abstracts—John S. Coulter, M. D.	220
Book Reviews	228
Chapter Directory	231

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The Physiotherapy Review

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Volume 23 September-October Number 5

Practical Application of the Kenny Principles in the Management of Acute Anterior Poliomyelitis

George L. Dixon, M.D., and Dorothy A. Graves, B.E., R.P.T.T.

The purpose of this article is to describe the use of the Kenny regime in the treatment of patients during the acute stage of anterior poliomyelitis, and record some of the results obtained. It is important to note that the personnel involved in giving these treatments was limited to a very strict minimum. Because of limited experience in the use of this method no attempt is made to draw conclusions as to the final results obtained. In the course of this study interesting and important facts concerning the quarantine period for patients with poliomyelitis have been established, and a plan of procedure has been established which may be found useful by others in the management of similar problems.

In July 1942 a special department was established for the specific purpose of treating patients in the acute stage of poliomyelitis by use of the Kenny technic. During the succeeding eleven months 215 patients who had definitely established diagnosis of poliomyelitis were treated, also 76 patients treated similarly until the diagnosis of poliomyelitis had been found to be incorrect. It is of particular interest to note that this latter group, which presented clinical pictures that resemble very closely those of poliomyelitis, finally were diagnosed, in order of their frequency, as follows: rheumatic fever, pneumonia, upper respiratory infection, meningitis, infectious neuronitis, hysteria, osteomyelitis, serum reactions, encephalitis, jaundice, neuritis, myalgia, malignant spinal tumor, myositis and peripheral nerve injury.

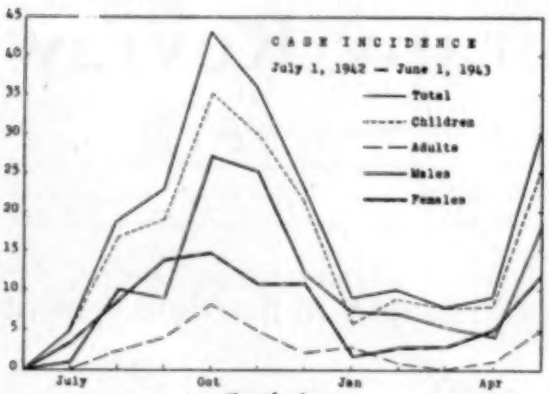
The occurrence of the disease during the period in which this study was made did not reach epidemic proportions but a peculiar feature concerning incidence was that it continued throughout the winter months and reached a peak in October, rather than July or August, as had been the case in previous years.

The number of patients admitted monthly during the period of this study and their classification as to age and sex are indicated in Graph 1. It will be noted that the number of children* parallels closely the total number of patients admitted; that males were more frequently affected than females, ratio of 1.38 to 1; that the ratio of children to adults was 5.7 to 1. The number of admissions during May 1943 was three times the average for each of the four preceding months, and this may be particularly interesting and important.

Table 1 contains the figures from which Graph 1 was derived, and a list of those who died as a result of bulbar involvement.

From the Departments of Communicable Diseases and Orthopedic Surgery of the Los Angeles County Hospital and the School of Medicine of the University of Southern California.

*Note: Define "child" in terms of age as being under 18.



Graph 1

Table 1

Month	No. Admitted	Children	Adults	Males	Females	Deaths
July	5	5	0	1	4	0
August	19	17	2	10	9	1
September	23	19	4	9	14	1
October	43	35	8	27	16	3
November	36	30	6	25	11	2
December	23	21	2	12	11	0
January	9	6	3	7	2	1
February	10	9	1	7	3	1
March	8	8	0	5	3	1
April	9	8	1	4	5	3
May	30	25	5	18	12	2
TOTALS	215	183	32	125	90	15

The inadequacy of these figures from the standpoint of an epidemiologist is fully realized. More complete reports from this hospital will follow.

Thirty of the patients had acute respiratory distress as a result of bulbar involvement. Of the fifteen that died from this condition ten were treated by means of respirators, four by packs alone and one patient died immediately after admission, before treatment could be given. Of the fifteen who survived, seven were treated with packs alone and made satisfactory recoveries; six were treated by the use of respirators, and progressed well, although two of these remain in the respirators. No conclusions can be drawn from these figures because the condition of some patients on their arrival at the hospital was so critical that respirators were used at once as the most acceptable form of emergency procedure. All but four of the patients who presented indications of respiratory involvement on admission were given continuous packs to the neck, chest and back until increased cyanosis and increased fatigue were deemed sufficient to justify use of respirators. The minimal time during which packs were applied before the use of respirators was seven hours; the maximal, seventy-two hours. All patients placed in the respirators also received packs to the neck, chest and back. As noted above, four patients were placed in respirators immediately after admission.

The shortest time that elapsed between the onset of symptoms and admission to the hospital was eight hours; the longest, fifteen days; the average, five days. For those who died, this period averaged 5.4 days; for those who survived, 4.7 days.

TREATMENT AND EQUIPMENT

In July 1942, when five patients were under treatment, packs could be provided easily, but when the number increased in August, real difficulties were encountered. In the absence of autoclaves or sterilizers in which to steam large numbers of packs the nursing staff devised an individual steam kettle, made by the use of three ordinary basins, arranged to form a double boiler and lid, and a hot plate (Figure 1). This obviates the use of a wringer except in the first preparation of the foments in the morning. Two sets of packs are provided for each patient and they are applied directly from the steam kettle to the patient. The average temperature of the packs

Figure 1

as they are removed from the kettles is about 150 F. They are free from excess moisture and the danger of producing burns is reduced to a minimum. Temperatures of fifty complete sets of foments were taken and it was found that the maximum variation between the first and last packs was 10.2 F; the corresponding change in packs taken from a steam table was 15.2 F. The average temperature produced by the two methods would be constant.

In December 1942 a steam table was devised for use in the larger wards (Figure 2). This contained twelve pots which were heated with boiling water and steam. By removing a pot from the table to the patients bedside individual packs were provided for each patient for his active period of quarantine. At least ten packs

Figure 2

are given to the average patient between 8:00 a.m. and 8:00 p.m. daily, unless the condition of the patient warrants continuous packing. One nurse or trained attendant can pack three patients.

Since May 1943, packs made of old wool blankets have been replaced by the use of Munsingwear for the hot foment only. These are more satisfactory because they mold to the part, retain heat well and are more durable. Two weights of packs are used, the lighter ones for the chest.

A small number of patients were found to be sensitive to wool and were protected by placing thin layers of gauze and cream of bismuth over the skin. In a few instances it was necessary to discontinue the packs for several days. In all other patients, the skin invariably remained in good condition without irritation or pressure sores.*

On admittance all patients are examined visually or manually, depending upon the severity of their condition. Obviously in the more severe conditions nothing but spasm is checked. Packs immediately are applied to the areas indicating the need for them. Patients are packed until their acute spasm has subsided and are then checked for alienation and incoordination. Passive motion and tendon stimulation are started at the earliest possible moment. In mild conditions passive motion to the point of pain is started at once. When the active muscle spasm is relieved sufficiently, muscle reeducation is started in the bed. As soon as possible the patient is allowed to sit on the edge of the bed and later in a chair, at all times trying to maintain the proper body alignment. Still later he should stand and walk if he can do so properly.

With a large number of patients and one technician, the administration of adequate treatment becomes a problem. Since these patients are in a part of the hospital set aside for treatment of poliomyelitis only, the technician can pass from patient to patient without having to scrub or change gowns between cases, thereby saving considerable time. All patients with a questionable diagnosis are kept in separate units. With an increase in the number of patients, we plan to use a clerk to record daily the technician's findings. In view of the various antigenic differences in the known strains of poliomyelitis virus, and the differences in the severity of the disease produced experimentally, it is perhaps questionable whether we are justified in permitting contact between patient and patient, such as this practical solution of nursing care permits.

The more severely involved cases are given the most careful supervision, but instead of giving an entire treatment at any one time, the involved parts are divided and treated in rotation. This prevents the patient from becoming too fatigued and allows the technician to spend some time on all patients. We believe this prevention of fatigue is most helpful.

As the condition of the patients improves and incoordination is controlled, they are allowed to do more for themselves and are encouraged to become interested in things which will keep their minds active and directed into normal channels. The children are allowed simple toys to play with or comic books to look at.

When the children have progressed to a stage where they will benefit by group association, they

*The general nursing routine of the poliomyelitis patient is, briefly, as follows: Baths are given at night on discontinuance of packs; the patient is put to bed in a flannel gown between wool blankets; enemas are given on admittance and thereafter whenever necessary; mineral oil is given routinely; and the patient is given a high caloric, high vitamin diet with fluids administered freely.

Figure 3

are allowed to eat one meal together in individually ized chairs at a low table. They all invariably eat better, particularly if one of the children is a hearty eater.

EQUIPMENT

The patient is placed in a hard bed or crib on arrival at the hospital. Because of inability to obtain large pieces of plyboard to place between the springs and the mattresses, boards are placed crosswise, and the lengthwise sag which still is present is taken care of by braces from side to side between the bed frame and the springs—two or three of these, depending on the weight of the patient (Figure 3). The cribs are made hard and flat by the use of three long boards running lengthwise. Footboards are used in every instance, the mattress being kept away from the board by four-inch blocks. Even those patients treated in the respirators are placed against an adjustable footboard.

With the armed services requiring more and more nurses, we are finding it necessary to train more attendants to apply packs in order to replace the graduate nurses. This is working very satisfactorily. Our student nurses do not work on these wards.

All cases requiring further care on leaving Contagious Disease are referred to one of several hospitals equipped to carry on further Kenny treatment. Those discharged home return to a special clinic in this hospital or to one of the other hospitals where they can have check-ups and necessary after-care as out-patients in the physical therapy department.

SUMMARY

We feel that we have worked out a usable plan by which a large number of acute patients may be treated adequately with a minimum of highly trained personnel, and that in the event of a true epidemic we will know how to expand the department rapidly.* At a later date it perhaps will be possible to make a definite statement as to the percentage of patients recovering or retaining residual paralysis.

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*With a sharp rise in the number of cases beginning in May, we are evidently in our epidemic now, because during June (and not included in these statistics) that were admitted to the department 59 cases.

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Reciprocal Action Skiis in the Treatment of Cerebral Palsy

Robertine St. James, R.P.T.T.

It is the purpose of this article to present a newly designed apparatus for the cerebral palsied child which is simple enough in construction to warrant a place in every department treating this type of case. The apparatus, to be referred to as "reciprocal action skiis," consists of a plurality of parts, assembled in such manner that the completed mechanism affords a means of rehabilitation, aimed toward assisting such patients to regain ambulatory function.

Figure 1. Ski poles.

Miss Mary Trainor, of the Children's Hospital, Boston, Massachusetts, has used ski-skates for several years to correct and improve the leg function of cerebral palsied children and the cord injured group of patients. They give a steadier base, and because the skate extends beyond the foot, heels are encouraged to approximate the floor. In stair walking, the skate blocks itself against the riser, causing trunk and hip action to be made easier by this stabilizing factor. They are especially helpful in correcting a scissors gait.

More recently Dr. Winthrop Phelps began to use larger skiis with poles attached in front (Fig. 1) for walking training at the Children's Rehabilitation Institute, Cockeysville, Maryland. These are indispensable for teaching balance, leg reciprocation, and for strengthening various muscle groups, but they offer little arm activity beyond a reach and grasp. The reciprocal action skiis, which are to be considered a progression from the ski-poles, and not a substitute for them, seem to suggest a solution to that problem.

Figure 2 demonstrates the essential difference between the ski-poles and the reciprocal action skiis. In the latter, canes at the sides replace the poles in front. This not only presents a better body alignment but allows normal arm and leg reciprocation. It also helps to develop lateral balance, while the ski-poles encourage antero-posterior balance. The canes are anchored just off center and are provided with a hand grip which should be extensible by about six inches in order that they can be adapted to several different children if necessary. They are supported and

Figure 2. Reciprocal action skiis.

Cerebral Palsy Unit, State Hospital for Crippled Children, Elizabethtown, Pa.

This paper has been read and favorably commented upon by Dr. Winthrop Phelps, 3038 St. Paul St., Baltimore, Maryland; Miss Mary Trainor, The Children's Hospital, Boston, Massachusetts, and Dr. Tom Outland, Chief Surgeon, State Hospital for Crippled Children, Elizabethtown, Pa.

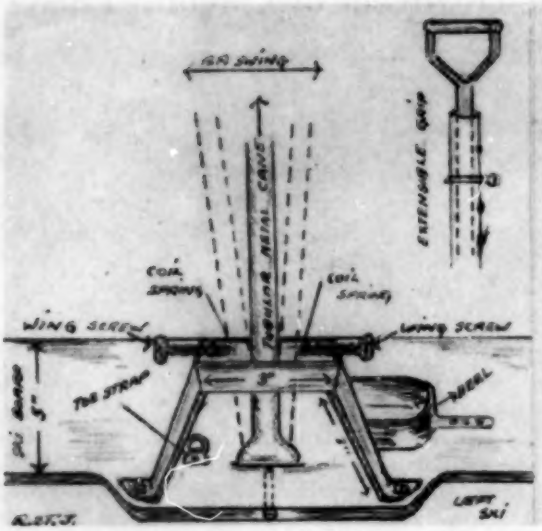

Figure 3. Metal brace (left).

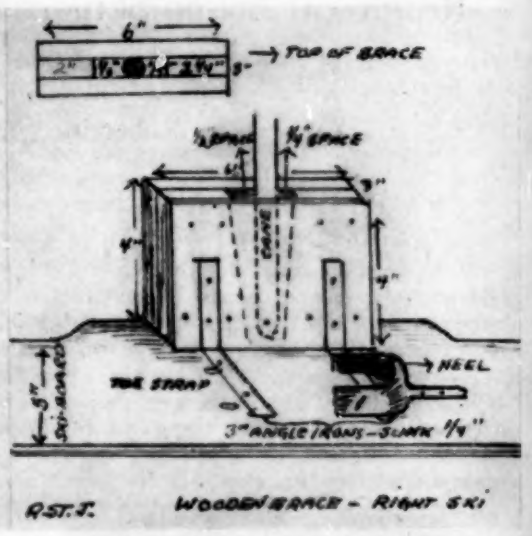

Figure 4. Wooden brace (right).

controlled by braces, whose composition may be metal, plastic or wood. The brace (Fig. 3) is arranged to give antero-posterior play. By means of wing screws with lock nuts, the range of swing is adjustable to the point of preference, or the cane may be made stationary for preliminary work and standing balance. Very light coil springs, inserted between the cane and brace, cause the cane to return to neutral and allow some resilience of action. In juxtaposition to the pivotal mounting are suitable foot attachments on the ski board.

For practical purposes a wooden brace acting on the same principle has been tried and found to be very satisfactory. This is shown in Figure 4. The measurements listed insure its stability, and a pair of three-inch angle irons give adequate reinforcement at the point of greatest strain. Minute adjustments in the degree of antero-posterior swing are not possible here, but with the cane blocked posteriorly at ¼" and anteriorly at ½", a twenty-inch cane would have a five-inch total swing. Wedges are used for fixation when it is desired. A metal cane (piping) with a tubular extension still is to be preferred for adjustability.

The ski itself is made approximately three times the length of the foot, with the foot piece placed on the middle third. This, however, is no set rule, for individual differences may necessitate readjustments. One child may find his center of balance directly in the middle, while another may find his slightly forward or more to the rear. A width of five inches has been used, with a projection at the site of the brace to allow for its attachment without interferring with the foot placement. The cane is attached about two and one-half inches ahead of the lateral malleolus.

Side boards may be added in front (inside) to eliminate internal rotation, or in back to eliminate external rotation. If more active dorsiflexion is desired the foot is placed more toward the front. In the case of a heel walker it is placed farther back.

The logical progression with the reciprocal action skiis would be standing balance, assisted walking and unassisted walking with the canes stationary. This is to be followed by arm reciprocation standing (passive, assisted and active), then to combine arm and leg reciprocation. A series of maneuvers such as turning, side-stepping, backing up, sitting down and getting up encourages independence within the child.

Holiday Greetings to Physical Therapists Overseas

THE PHYSIOTHERAPY REVIEW, as the voice of American Physiotherapy Association wishes at this time to extend the very best holiday greetings to all those serving overseas.

Progressive Relaxation In Physical Therapy:

*II. Summary for Student Technicians**

Anna Wetterhuus** and Bernardine Lufkin

The value of relaxation is well known to the experienced physical therapist. The irritable, overexcited patient offers a familiar problem, and routine procedures often are directed largely to relief of muscle tension, specific or general. In training of the technician, however, therapeutic relaxation ordinarily is not taught as a separate subject, although its scientific basis has been thoroughly explored.[1]

When the School of Physical Therapy was opened to civilians at the Cleveland Clinic in the summer of 1942, an eight hour course in progressive relaxation was included in the curriculum. The students were surprisingly apt in learning both the theoretical background and the actual technic of relaxing their own muscles. Results of a shorter course given to a Naval class also were encouraging. In both the civilian and the Naval course most of the lesson period was devoted to practice in relaxing the principal muscle groups by methods to be used with patients. Practice was preceded by a brief lecture or discussion and a five minute demonstration. The text was a two-page mimeographed outline of therapeutic methods, supplemented by reference reading.

Details of the course in muscle training have been described.[2] Believing that a review of the physiology and clinical value of relaxation may be useful to the wartime student and graduate, we have summarized the theoretical material presented in class. The therapeutic outline and references are added.

Lesson 1. Introduction

During the past ten years the word relaxation has become more and more popular. "Just relax—take it easy," is almost current slang. Advertisements use the word constantly: Relax with a cigaret, relax in a de luxe motor car, relax in an expensive summer resort. During the early months of the war less was heard of the subject, but now it is more popular than ever. One is advised to relax for the fatigue of war work, for mental refreshment, and as a beauty treatment. A commercial firm exploits "the Marine who had no nerves because . . . he'd learned a secret—the ability to relax." The trade slogan for a well known drink is "One relaxed moment helps you work and fight harder."

Relaxation is just another word for rest, and treatment by rest is as old as pain itself. In fact, there is probably no single therapeutic measure more commonly used. Rest is employed in all diseases, mental and physical, and by all practicing physicians. Yet relaxation as such is not widely discussed in medical literature. In the Quarterly Cumulative Index Medicus, which represents most of the medical journals published, there are not more than two or three titles a year under the heading of relaxation, while far more specialized subjects claim scores or hundreds of references in every volume. Obviously, relaxation as a scientific and effective form of therapy has not been extensively reported by the medical profession.

However, a thorough study of the subject has been made by a contemporary physician.[1] who began his work over thirty years ago. He has divided his time between research and clinical practice. His laboratory findings have been applied constantly to a wide variety of patients, and his patients have suggested and been subjects of further investigation. The work has been described in books and a number of articles,[3] the material falling into three divisions:

1. The physiology of relaxation and tension, including their mental and physical effects in health and disease.

2. Development of a technic of relaxation which can be taught to both the normal and the sick. This can be carried to the point where tendon reflexes (knee jerk), muscular tonus and all

From the Cleveland Clinic Foundation, Cleveland, Ohio.
*Part I of this series appeared in the Archives of Physical Therapy, April 1943.
**Supervisor, Department of Physical Therapy.

types of emotional and mental activity completely disappear.

3. Construction of extremely delicate apparatus to measure the finest degrees of tension and relaxation. Electrical instruments a thousand times as sensitive as an electrocardiograph record values as low as a millionth of a volt, representing the minute muscular tensions that accompany mental processes. In other words, theory has been checked experimentally with exquisite precision.

A short course in relaxation can be hardly more than an introduction. Training in technic may require two months or two years; lessons may be given every day or once or twice a week; in practice the subject may spend from one to three or four hours daily.

But sometimes a patient can learn enough for his purpose in a single lesson. If you cannot practice an hour a day, it helps to relax completely at night before going to sleep. Noticing unnecessary tensions and releasing them whenever you can is a good beginning.

LESSON 2. BEGINNER'S DIFFICULTIES

Members of a class in relaxation will not become expert by the end of an eight hour course, although if you keep on with your practice you may teach it very well. But even if you learn only the fundamentals, your few hours of training will show you some of the difficulties tense patients have, and how to overcome them.

There is one thing of which you can be certain. If the patient is skeptical about relaxing, if he does not like it and says it is hard, he really is not relaxing. As Jacobson says, "It is important to make clear that relaxation is never hard and cannot be; it is either done, or it is not done; and that is all." But the more tense a patient is, the more he needs to relax, the less he wants to relax, as a rule, and the teacher must have unlimited patience and persistence.

When the patient is discouraged, let him know that learning to relax does not follow a magic formula; it is just as slow a process as learning other muscular skills. One cannot become an expert skater, swimmer or typist in five easy lessons. If tensions are habitual and longstanding, especially if associated with chronic disease, training must be long and thorough. And even with a perfect technic, it may take an hour to relax after a high speed day, although ordinarily a trained subject can relax completely in about fifteen minutes. Progressive relaxation begins at the point where the average person considers himself well relaxed, and it goes far beyond that point.

Two mistakes are commonly made by beginners.

1. They often are impatient and restless. Instead of relaxing, such a patient interrupts the process by slight and constant movements in the effort to find a more comfortable position. He is continually shifting an arm or leg, crossing his ankles or turning his head on the pillow.

2. On the other hand, a determined and conscientious patient usually will try too hard. In the attempt to concentrate on relaxing he holds his muscles rigid instead of letting them go limp. This type of tension is not so easily recognized as the first, but if you watch carefully you can notice small movements of the eyelids, wrinkling of the forehead, or a general stiffness of posture. The face is alert and attentive, and there is quick response when the teacher enters the room instead of the slowed reactions and dull expression of the well relaxed subject.

But no matter how tense he is, even if skeptical and not inclined to cooperate, the patient will learn to relax if regular supervised practice is continued long enough. There are a few exceptions to this rule, however. It is difficult or impossible for a patient to relax (1) if he is in severe pain, or (2) if he has been influenced by hypnosis or hypnotic suggestion. Otherwise only time and patience are needed. Even if a year or two must be spent in training, this compares favorably with duration of routine courses of therapy for tuberculosis, high blood pressure and other chronic diseases.

LESSON 3. ASSIGNMENT OF FINAL REPORT AND REFERENCE READING

Students were asked to hand in a progress report at the end of the course in place of an examination. They were to analyze their own experience and success in learning to relax, giving reasons for ease or difficulty of learning. See also references at the end of this article; the students' list purposely was limited to essential material.

Required Reading

Jacobson, Edmund:

You Must Relax, ed. 2, New York, Whittlesey House, 1942, prefaces, chapters 1-8, 15-17.

Indications for Progressive Relaxation in the Practice of Medicine, in Principles and Practice of Physical Therapy, edited by Mock, Pemberton and Coulter, Hagerstown, Md., W. F. Prior Co., 1934 (later revised), vol. 1, chap. 12. The Technic of Progressive Relaxation, vol. 3, chap. 18.

Suggested Reading

Jacobson, Edmund:

You Can Sleep Well, New York, Whittlesey House, 1938, chapters 8-13.

Progressive Relaxation, ed. 2, Chicago, University of Chicago Press, 1938, chapters 1-6, 20, 21.

The Physiological Conception and Treatment of Certain Common "Psychoneuroses," Am. J. Psychiat. 98:219-226 (Sept.) 1941.

Cultivated Relaxation in "Essential" Hypertension, Arch. P. T. 21:645-654 (Nov.) 1940.

LESSON 4. MENTAL ATTITUDE OF THE TENSE SUBJECT

During class practice one student was unusually tense and restless. She was asked to write down her general impression of relaxation, and she has expressed very well the feelings of a tense and unwilling subject.

"To learn how to relax is downright unpleasant. I found myself striving to relax my biceps. The tension of the muscles undoubtedly was mental. I wanted to get up and take a run around the block, but I compromised; I stayed where I was, but I squirmed. I was thinking of all the things I could have been doing, and it didn't seem sensible to lie there and do nothing. But there I was, frustrated. I wanted to be up but I was down. The difficulty of trying to relax under this condition is understandable."

In other words, she knew that she was impatient and rebellious, but she did not mention the actual muscular tension which caused her mental state. It is doubtful if she was aware of it. The discomforts of a healthy student vainly trying to relax are mild indeed compared with the miseries of a hypertense and emotional patient. Take the case of a woman who, after two bad falls, a serious illness and great anxiety over an invalid husband, had become so nervously overwrought that she was afraid to take a single step alone, for fear of falling. Normally she had been intelligent and self controlled. But she was rigid with terror and almost screaming as the physician walked down the hall with her, withdrawing his support from time to time. He used only one approach in this case, and it finally brought about a permanent cure; he merely showed her how to relax the rigid muscles she had been unable to control. He never wasted time trying to reason away her fears; when she relaxed they disappeared.

If your discomfort and impatience are hard to bear, the simplest way out is to relax until you are comfortable. And the longer it takes to learn, the better you will understand the psychology of your tense patients.

LESSON 5. VALUE OF RELAXATION IN DAILY LIFE

A healthy group of students who have always enjoyed life, working hard and sleeping well, may think that detailed training in relaxation is a waste of time. What can it give you that you do not already have? What can it add to your usefulness as physical therapy technicians?

In your clinical practice you will have many patients who must be taught to relax certain muscles; for instance, those afflicted with various spastic conditions or speech defects. Relaxation is useful in other diseases which will be reviewed later. Learning to control your own tensions is the best possible preparation for teaching patients to relax. But in addition to its clinical use, an expert technic will be invaluable to you as physical therapists in relieving your own fatigue and in easing the stress of daily life. The physiologic advantages of relaxation were discovered in early experiments.

1. In study of the nervous start that follows a sudden noise, it was found that this reaction gradually disappeared as the subject became relaxed. Not only did the sound become less noticeable, but the intensely unpleasant sensation of being startled also vanished.

2. It was further noted that sleeplessness was accompanied by some muscular tension, even if slight, and that when this was released the wakeful subject fell asleep.

3. The reaction to a fixed degree of painful stimulation was next observed. The fingers of the subjects were placed in salt water and an electric shock was applied, in each case producing pain which caused an upward jerk of the arm. Both the electric current and the motion of the arm were measured. In a large series of tests the pain and the reaction to it grew less with relaxation, until with complete absence of tension no pain was felt and the arm remained motionless.

These and later studies showed not only that pain, nervousness and reflex action diminish with relaxation, but that the same is true of emotion and all types of mental activity. There is a general vague understanding that relaxation reduces mental and physical strain. Laboratory instruments show that expert technic gives a new method of mental and emotional control. All who deal with the sick need a high degree of poise and self control, to inspire confidence in the patient and to meet the difficult and trying situations common in clinical experience. Merely

the lessening of irritability and fatigue that comes with a fine technic of relaxation will repay you for every hour spent in practice.

LESSON 6. RELAXATION AND MENTAL ACTIVITY

(This and the following lessons were planned as lectures, but questions from the students led to discussion, as indicated.)

Question: I have been reading about the very slight "residual" tensions which may remain when the muscles are rather well relaxed. Why is it necessary to relax these small tensions? I should think fairly good relaxation of the large muscles would be enough.

Answer: In some cases it is, but in others the desirable therapeutic effect occurs only with an extreme degree of relaxation. For instance, the patient with high blood pressure needs great skill. And the psychoneurotic patient must relax the most delicate tensions in order to control his mental processes.

Question: How can relaxation of muscles control the mind?

Answer: A long series of experiments show that all mental activity is associated with tension of voluntary muscles somewhere in the body. When you are remembering, imagining, dreaming, or solving a problem, you do it with some form of imagery. If you think of action, like playing golf, you use the same muscles that take part in actual movement, but on a microscopic scale. If you have a mental picture, if you see something in your "mind's eye," your eye muscles are somewhat tense, as they would be if you were seeing a real object. Often during visual thought real motion of the eyes can be seen under the closed lids. If you are thinking in words and sentences, your lips, tongue and throat muscles are active.

The minute muscular tensions that accompany thought have been electrically measured in hundreds of records. All subjects who learn complete relaxation discover for themselves, without being told, that when all the extremely slight tensions are relaxed thought fades out.

Tests were made to see whether in thinking an actual movement occurs that can be measured by a lever as well as electrically. With a lever that magnified motion eighty times or more, it was found that during imagination of bending the arm, the arm really does move steadily at microscopic rate—two or three hundredths of a millimeter a second. Can you imagine deliberately controlling your muscles and making such a movement if you were asked to?

When you consider the extreme minuteness of the muscular activity associated with thought, which is recorded electrically in millionths of a volt and mechanically in hundredths of a millimeter, you can easily understand why it has not been generally known that muscular action is necessary to thought. This action is so delicate that it can be hidden by the usual tensions of the waking state. When subjects were trained to relax all residual tension it was possible, against this blank background, to record the tensions of mental activity. It became clear that a mental process could be diminished or completely checked merely by learning to relax.

LESSON 7. THERAPEUTIC USE OF PROGRESSIVE RELAXATION

Various diseases have been partly or wholly cured by relaxation, alone or combined with other therapy. All of them are associated with muscular hypertension, which as you know involves overactivity of nerves as well as muscles. Among them are obviously tense conditions like asthma and spastic paralysis, and disturbances of the gastro-intestinal tract, such as spastic esophagus, peptic ulcer, and tense states of the colon resulting in constipation or colitis. Muscular hypertension is a component of all functional disorders, including many usually classed as nervous or mental, and relaxation is indicated here as well. It is definitely helpful in the state of arterial constriction known as "essential" hypertension or high blood pressure, and in certain types of heart disease.

Medical literature is much concerned with the group of diseases characterized by mental and physical overactivity.[4] It is claimed that about a third of the illness in this country has an emotional basis.[5] In sharp contrast to mortality from the well controlled contagious diseases, deaths from cardiovascular-renal diseases are steadily increasing,[6] and the 1943 death rates for cerebral hemorrhage and the chronic heart diseases are the highest on record.[7]

In addition to the clearly diagnosed diseases which can be treated by relaxation, there is a large but ill-defined group classed vaguely as neurotic, psychotic or hypochondriac, or lumped under the heading "nervous exhaustion." Of the war casualties returned to the United States for hospitalization, thirty per cent are said to be nervous and mental patients,[8] for whom are coined such terms as "Guadalcanal neurosis."[9] Well known in peace times are the mentally maladjusted, physically wretched misfits who wander

from mental hygienist to psychoanalyst, from chiropracter to Christian Science healer. They offer a promising field for the therapist who is able to teach relaxation.

Experiments have shown that the muscles not under voluntary control, including those of the heart, blood vessels and gastro-intestinal tract, become relaxed as the voluntary muscles become well relaxed. On the other hand, muscular tension definitely increases heart rate, blood pressure and emotion, as well as other types of mental activity. Progressive relaxation is thus a logical remedy for the diseases under discussion.

Question: A book has just come out in which the author says he has improved his vision by relaxing exercises. Is he describing progressive relaxation?

Answer: I have only read reviews. The book is probably indirectly concerned with relaxation, but if it is like most popular books on the subject, it lacks the scientific approach.

Question: How would you define scientific relaxation?

Answer: Scientific relaxation, except in special cases, is limited to simple muscle training. The therapist wastes no time in roundabout, indirect methods, and particularly avoids suggestion.

Question: Why is suggestion harmful?

Answer: It leads to dependence of the patient, and the effects are usually not lasting. "Miraculous" cures often are of this type. The patient who is taught scientific relaxation learns to rely on himself rather than on the therapist. A great advantage of progressive relaxation is that, like other muscular skills, once learned it seldom is forgotten.

LESSON 8. POPULAR MISCONCEPTIONS: APPROACH OF THE PHYSICAL THERAPIST

During the last class a student commented on a recent book on relaxing the eyes, and the unscientific approach of popular writers was mentioned. You may be interested in some examples.

A common mistake, made by physicians as well as laymen, is believing that before you can relax you must exercise vigorously. This is a useful approach for a person without muscular control, but not necessary for one who is trained in relaxation. However, anyone who has accidentally found a way to relax will cling to the exact formula that led him to it.

In a typical medical article "ten tricks" are described as an aid to relaxation.[10] The advice to "force your mind to grapple with cumbersome facts, bore it into unconditional surrender to sleep" is directly contrary to the simple technic you have been learning. Also mentioned is the roundabout and superfluous method of dampening and chilling of the body so that returning warmth will induce relaxation.

It has been claimed that "breathing exercise, as compared with Jacobson's technic, may be freed from the activity of thinking," and a method of "controlled breathing" is said to be completely effective in relaxing the tense patient.[11] The misunderstanding is obvious.

It is even stated that relaxation should be "suggested" to patients, and it is said that during each practice period the muscles should be strongly tensed before relaxation.[12] This author also is departing from the simple principles of progressive relaxation.

In 1892 a nurse wrote a practical book on relaxation that was a best seller for years.[13] She knew a great deal about teaching patients to relax, although she did not understand the underlying physiological principles. But she gives a vivid picture of her clinical experience with tension, and no doubt the book would interest you.

In a field so widely misunderstood, yet offering great opportunities in medical practice, what can you accomplish as physical therapists? When and how can you teach relaxation?

Student: During massage the patient must be taught to relax for good results.

Teacher: Many of your procedures involve relaxation; training requires no apparatus other than a place to lie or sit, and it can readily be combined with other therapy, such as light or heat treatments. Like the trained nurse, a physical therapist tries to make the patient comfortable and put him at ease. Showing the patient how to relax various tensions is a shortcut to this end. The physician may call on you to teach relaxation under his direction, but even if he doesn't, you will find your own uses for it. A technician told the other day about a patient who came in for treatment wringing her hands and complaining of a sleepless and miserable night. In a few minutes the therapist showed her how to release the severe tensions in her hands and arms; in surprise and delight the patient exclaimed, "Why, that's the first time in my life I ever relaxed!"

Student: We can be sure of one thing: Even if we do not succeed in teaching patients to relax, it cannot possibly do any harm to try.

TECHNIC OF TEACHING PROGRESSIVE RELAXATION: OUTLINE FOR THERAPIST

General Procedure

1. Patient lies supine on cot or table, legs not crossed, head on pillow if desired. Instructor demonstrates tension by having patient contract muscle group, as bending left arm for biceps. Then, attention being drawn to sensation of local tenseness, patient is asked to relax muscle group by merely *not doing*—by ceasing the action, noting disappearance of tense feeling as muscles become limp. Patient continues to relax for 45 to 60 minutes; instruction is repeated two or three times, more if necessary, during the period.

2. Patient practices alone one or more periods daily, a period being limited to half hour if patient is restless, 50 to 60 minutes if fairly comfortable. Instruction is given from twice weekly to once daily. The maximum daily time which can profitably be spent in practice is 5 hours, including an hour lesson.

When practicing alone, patient begins by relaxing at outset, without preliminary contraction. All muscle groups previously covered are relaxed with each new group. Suggestion is strictly avoided. Patient is told that even with good technic, complete relaxation takes 15 minutes to an hour, depending upon previous state of tension; that expert relaxation, like other muscular skills, is learned slowly but seldom forgotten. If during practice patient is restless or holds himself rigid in trying to relax, attention is directed to specific tensions and he is asked to let them go.

Signs of Tension and Relaxation to be Noted by Therapist

Tension: The patient is restless or rigid, generally or locally. This actually can be seen or noted by palpation or passive motion. Breathing is quickened or exaggerated, with frequent sighs. The patient complains of impatience and local or general discomfort. The face is alert and expressive, with raising of brows, frowning, winking, and slight movements of lips and eyes. The patient speaks and moves quickly when addressed.

Relaxation: Absence of all the above signs is noted, particularly of even slight movement. Reflexes are absent and muscles limp. The patient's voice is soft, sometimes almost inaudible, and he speaks or moves slowly when addressed. The facial expression is peculiarly vacant and unintelligent. The patient reports that during complete relaxation he feels nothing at all and his mind is a blank.

Muscle Groups in Order of Training

Arms, 4 groups: left biceps, triceps, hand flexors and extensors; right same.

Legs, 6 groups: Left foot flexors and extensors, leg flexors and extensors, thigh flexors and extensors; right same.

Abdominal muscles, 2 groups: those that draw abdomen in, raise trunk from supine to sitting position.

Respiratory muscles (take deep breath, then relax to effortless breathing).

Erectores spinae (arch back).

Left pectoral group (forward and inward extension of arm), right same.

Interscapular group (backward movement of shoulders).

Muscles, 4 groups, bending head right, left, forward, back, in turn or together (hold head up stiffly).

Forehead and eyes: muscles that rise eyebrows, frown, close eyelids tightly; move eyeballs, left, right, up, down; direct gaze straight forward. Imagine (eyes closed) looking at various objects in different positions, moving and stationary.

Lips and other speech muscles: smile, purse lips, protrude and retract tongue, close jaws tightly, open jaws; count 1-10 aloud, then softly, whisper, imagine counting. Swallow.

Some of the groups listed may be omitted or others added. Training may be limited to a single lesson or continued for one or two years, as indicated. If tension is severe and of long duration, protracted training may be needed.

Differential Relaxation

1. After patient has learned to relax fairly well lying down, some or all muscle groups are reviewed with patient seated in chair, instruction and practice periods being same as for supine position. Head hangs forward limply. Because of strain on unaccustomed tendons, this usually is painful at first, but becomes comfortable in a few days of practice. Legs can be extended, arms supported or hanging loose, head supported if discomfort is unbearable. When used to it, patients often doze in this position, head and arms hanging loose.

2. Seated but head up, relax eyes partially while open, slightly shifting them now and then. Relax other muscle groups, singly or together, at same time.

3. Relax as far as possible while reading,

with just enough tension to hold book and follow meaning of sentences.

4. Relax special muscle groups while carrying on various activities, as leg extensors while writing, biceps sitting in street car.

Suggested Division, 144 *Hour Course Including Lessons and Practice*

Left and right arm, each 6 hours.

Left and right leg, each 9 hours.

Trunk 4 hours, neck 2 hours.

Forehead and eyelids 3 hours; eyes, actual looking, 8 hours; eyes, imagined looking, 8 hours.

Cheeks 1 hour, jaw 2 hours, lips 1 hour; speech, audible, 5 hours; speech, imagined, 8 hours.

Seated in chair, differential practice, review all groups as above, 72 hours.

Suggested Division, 18 *Hour Course, with One Hour of Supervision for Each Two Hours Alone*

1. Both arms, tense all muscles together, clenching fists, slowly relax.
2. Bend both feet down at ankles, bending toes down at same time, relax.
3. Sigh deeply, then breathe easily, with least possible effort.
4. Raise eyebrows, relax completely; then frown, relax.
5. Look right, left, up, down, with eyes open; relax short time with eyes open, then close and continue relaxing.
6. Count aloud to 10, count half as loudly, count in whisper, relax all speech muscles.

Short Cuts in Training

1. Practice only one muscle group in each area of body, as arm flexors, foot extensors, or erectores spinae.
2. Practice right and left muscle groups together, as right and left biceps.
3. Practice adjacent groups together, as whole right arm including fingers.
4. Omit training of muscle sense.
5. Relax only the muscle group or area most tense.

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Exhibits Available

1. "Reproductions of the Pictures on the History of Physical Therapy":
   8 posters, 22x28 inches, containing 19 reproductions of pictures on hydrotherapy, electrotherapy, massage, exercise, etc., from the earliest times. Posters will be shipped in frames ready for hanging. Weight when packed for shipping 60 pounds.
2. A motion picture film 200 feet long, on "Massage." (16 mm.)
3. "Posture Plays an Important Part in the Physical Therapy of Bed and Convalescent Patients":
   6 posters, 22x28 inches, in frames with photographs showing: good and bad posture of a patient in bed; good and poor posture in a wheel chair; instruction in walking with crutches and with a "walker." Weight when packed for shipping approximately 60 pounds.
4. "Statistical Map" showing schools approved by the American Medical Association, location of American Physiotherapy Association Chapters, Membership, etc. Weight when packed for shipping 46 pounds. This is in pastel colors. Should be displayed on an easel as it is too heavy to hang. Size 45x35 inches.
5. Poster 22x28 on the American Physiotherapy Association. "Requirements for Membership, Curriculum Content, Scope, Membership and Chapter Growth."
6. A motion picture film (16 mm.) "The Maintenance of Neutral Position of Patients with Infantile Paralysis During Nursing Care in the Hospital and in the Home."
7. Poster showing publications of the American Physiotherapy Association individually mounted (with request slips).
8. Poster: "The Nation Needs Physical Therapists."
9. Poster on pool construction and design.

For information regarding these exhibits, write Dorothy Dean, Exhibits Chairman, 33 E. Division Street, Chicago, Ill.

Relearning to Walk

Mildred F. Heap

In an attempt to do away with the unnecessary use of walkers and crutches, the author believes that the best and quickest method of teaching a patient who has not been ambulatory for some time to walk again is to apply the principles which are involved in the original process of learning to walk.

One of the first physical manifestations of the new born baby is his ability to kick, and his kicking develops progressively as he grows older. These kicking movements begin to lay the foundation for eventual walking by developing not only muscular strength and joint mobility but also the control of neuromuscular automatisms which are involved in walking. Along with this physical development the child gradually acquires a postural sense by first learning to control the movements of his head, then the movements of his body, until at last he is able to sit without toppling over. But what happens when he tries to stand on his feet? He places his feet wide apart, pulls himself to a standing position, but, nonetheless, falls down, for he has not yet learned to balance the weight of his body on his feet, and he finds this to be a long-term process. For months he walks with a waddling gait and falls frequently, and not until well past his second year does he learn to walk normally. Thus we find that a normal gait is the epitomy of nervous and motor developments, postural stability and equilibrium.

Relearning to walk obviously does not take as long as learning for the first time, although the principles involved are the same.

Preparatory to weight bearing most patients have spent much time in bed so that it is necessary through some form of physical therapy to encourage muscular strength and joint movements of the lower extremities, back and abdomen, making sure that hip abductors and extensors are strengthened as well as hip flexors, adductors and rotators. Sufficient strength in the quadriceps is necessary to keep the knees from buckling when weight is put on them. The peroeneus brevis, gastrocnemius, soleus and posterior tibal muscles must be strengthened since they are responsible for lifting the heel in walking. If contractures exist, as they frequently do, especially in the tendon Achilles, they must be lessened to give freedom of joint movement. The most important point to keep in mind, however, concerning the development of the muscles of the foot for walking is not the amount of strength of the muscles but a balance of power between the opposing groups. Strengthening the muscles of the back and abdomen is essential for maintaining a postural stability in the sitting position as well as in the standing position. The patient first must acquire postural stability in the sitting position before standing or walking can be attempted successfully. This is particularly difficult for patients who have been in bed over a long period and therefore much time must be spent improving equilibrium and postural stability to the degree that the patient is able to sit unassisted either on the side of the bed or in a straight chair. Emphasis also should be placed on abdominal retraction and sitting tall, for good posture is essential to a normal gait.

When sufficient strength, joint movement, muscle coordination and postural stability have been acquired, the patient is ready to bear his weight on his feet. In order to take care of the patient's lack of balance when he first stands, the feet should be placed in a fairly wide stance—approximately six inches apart for children and approximately eight inches apart for adults—increasing the width of stance for greater stability if necessary, or, as Morton suggests, place the feet at a 30-40 degree angle of outward rotation. The width or angle of stance, of course, decreases when walking is begun. The patient in learning to stand will need a little support, which should be given in front of him. Support from the technician's hands usually is sufficient, if emphasis is placed on keeping the body weight over the subastragular joint upon which normal standing postural stability is maintained. In the standing position half of the body weight should be on the forefoot and half on the heel. This

Vanderbilt University Hospital, Nashville, Tennessee.

attempt to regain a sense of balance should be done two or three times a day and must be continued until the patient can stand without support and with the feet in the position of a normal gait.

Having mastered this, he should next attempt the coordination of muscular automatisms in the standing position in the following manner: With only slight support from the front and without taking any steps, weight should be transferred to one foot while the opposite hip and knee flex and ankle extends, the toes being kept flat on the floor. This movement should be done alternately with the left foot then with the right foot until a smooth and coordinated transference of weight from one foot to the other has been accomplished and until the entire weight of the body can be held on one foot. Actual steps now may be attempted. Again the patient must concentrate on putting his entire body weight on his feet and not on any other support. At this stage the patient's ability to walk will depend solely upon how well he has regained his sense of balance. When assisting someone to walk, the technician should stand in front of the patient, and, instead of trying to hold him up, should let him use the technician for whatever support he deems necessary. Experience soon will show how much and to what extent to decrease the stability of support. If the patient already has gained some balance and has learned from the beginning to put his weight on his feet instead of on his hands, very little assistance will be needed.

Since a normal gait requires the proper functioning of the foot, the patient must be taught the correct way to use the foot in walking. This necessitates a method demanding not only the least amount of strain on the structural capacity of the foot, which includes the interrelationship of all the bones of the foot and the tautness of their ligaments, but also the least amount of energy necessarily expended by the muscles in propelling the body forward in motion. Because the foot is more structurally stable along its outer border than along the medial border, the weight of the body should be directed to the outer border of the foot after the weight has been received by the heel. This direction of the body weight should coincide with the stance phase of walking, thus giving the body the greatest amount of structural stability for balancing on one foot while the other foot is being swung forward. From here the weight is rolled forward to the heads of all the metatarsals, and the body is propelled forward from the toes especially from the big toe, which is structurally capable of bearing more of the body weight than any of the other toes.

Signs of foot instability from improper function and limps, such as Trendelenburg, should be looked for and attempts made immediately to alleviate the condition. A shoe should be worn from the very beginning of weight bearing and it should be a shoe which fits the foot properly, has a close fitting back, a heel about one inch in height, a tie or strap to give the midfoot some support and a vamp long enough to allow freedom of all the toes and wide enough for the toes to have only slight contact with one another. Such a shoe is essential to the normal function of the foot.

The patient should practice standing and walking without support several times a day until he has fully regained not only his sense of balance but his confidence in the stability and security of his legs and feet adequately to hold his body weight as well as to propel it in motion. Walking backwards, sideward and turning corners will help to hasten his recovery of equilibrium. Ascending and descending stairs, preferably four inches or less in height, first with slight support then without support, should be a subsequent process in the treatment.

Unless complete weight bearing is contraindicted or the mechanisms of equilibrium are permanently impaired or the musculature is not sufficiently strong to enable the patient to walk unaided, walkers, crutches and canes have no place in the process of relearning to walk. Such supports influence the patient to concentrate much of his body weight on his hands instead of on his feet, thus lengthening the time required to learn how to walk unassisted. By using the principles mentioned above, however, the patient learns the technic of a normal gait from his very first step., and by concentrating on the acquisition of balance at the beginning of weight bearing, he is able to develop a normal gait in a surprisingly short time.

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Schools Approved for Training Physical Therapy Technicians

By the Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements *	Duration		Time of Admission		Tuition**	Certificate Diploma Degree **
				Regular Course	Emergency Course	Regular Course	Emergency Course		
Children's Hospital, Los Angeles	Steele F. Stewart, M.D.	Miss Lily H. Graham	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos.	6 mos.[1]	Feb. and Sept.	Feb. and Sept.	$200 R $200 E	Diploma R Certificate E
Stanford University, Stanford University, Calif.	William H. Northway, M. D.	Miss Catherine Worthingham, A.B., M.A.	(a) R. N. (b) Phys. educ. major (c) 3 yrs. coll.	12 mos.[1]	7 mos.[1]	Jan. and June	Jan., Mar. June and Sept.	$429 R $286 E	Certificate or B. A.
Walter Reed General Hospital, Washington, D. C.	B. A. Strickland, Jr. Capt., M. C.	Miss Emma E. Vogel	Phys. educ. major	.....	6 mos.	.....	Quarterly	None	Certificate
Northwestern University Medical School, Chicago	John S. Coulter, M. D.	Miss Gertrude Beard, R.N.	(a) R. N. (b) Phys. educ. major (3) 3 yrs. coll.	9 mos.[1]	6 mos.[1]	Oct.	Jan. and July	$200 R $200 E	Certificate
Bouve'-Boston School of Physical Education, Boston	Arthur L. Watkins, M.D.	Miss Constance K. Greene	High sch. grad.	3 yrs. 4 yrs.[2]	6 mos.	Sept.	Aug.	$400 yr.	Diploma or B. S.
Harvard Medical School, Boston	Frank R. Ober, M.D.	Miss Janet B. Merrill	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.[3]	9 mos.	6 mos.[1]	1944—exact date on inquiry		$200 R $200 E	Certificate
Boston University, Sargent College of Physical Education, Cambridge, Mass.	Louis Howard, M.D.	Mrs. Lucille W. Fuller	2 yrs. coll.	2 yrs.	[4]	Oct.	[4]	$547	Certificate and B S.
University of Minnesota, Minneapolis	M. E. Knapp, M.D.	Miss Sara E. Kollman, R.N.	(a) R. N. (b) Phys. educ. major (c) Medical technology grad. with B.S. degree	12 mos.[1]	.....	June and Sept.	.....	Univ. fees	Certificate
Mayo Clinic, Rochester, Minn.	Frank H. Krusen, M.D.	Mr. Carl O. Moe, R.N.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	.....	6 mos.[1]	.....	Jan. and July	None	Certificate
St. Louis University School of Nursing, St. Louis	Alexander J. Kotkis, M.D.	Sister M. Consella, R.N.	High sch. grad.	4 yrs.[1]	.....	Jan. and Sept.	.....	$250 yr.	B. S.
University of Buffalo School of Nursing, Buffalo	George G. Martin, M.D.	Miss Edna Beaver, R.N.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos.[1]	6 mos.[1]	Feb. and Sept.	Feb. and Sept.	$425 R $375 E	Certificate
Hospital for Special Surgery, New York City	Kristian G. Hansson, M.D.	Miss Ethel M. Willmer	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.[1]	6 mos.[1]	Sept.	Sept.	$300 R $200 E	Diploma
D. T. Watson School of Physical Therapy, Leetsdale, Pa.	Jessie Wright, M.D.	Miss Kathryn Kelley	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.[5]	12 mos.	.....	July	.....	$200	Diploma
Richmond Professional Institute of the College of William and Mary, Richmond, Va.	Thomas W. Wheeldon, M.D.	Miss Alice Jones	(a) R. N. (b) Phys. educ. major (c) Coll. grad. (d) High sch. grad.	9 mos. 4 yrs.	....	Feb. and Sept.	.....	Coll. fees	Certificate or B. S.
University of Wisconsin Medical School, Madison	Ernst A. Pohle, M.D.	Miss Margaret Kohli, B.S.	(a) R. N. (b) Phys. educ. major	12 mos.[1]	6 mos.	Feb. and Sept.	Feb. and Sept.	Univ. fees	Certificate

Name and Location of School	Medical Director	Technical Director	Entrance Requirements	Duration Regular	Duration Emerg.	Time of Admission	Tuition	Certificate Diploma Degree
College of Medical Evangelists, Los Angeles	Fred B. Moor, M.D.	Albert H. Carlson	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	12 mos.	.....	Jan. and July	$ 225	Certificate
Barnes Hospital, St. Louis	Frank H. Ewerhardt, M.D.	Beatrice F. Schulz	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	6 mos.	Oct.	$200	Certificate
New York University, New York City	William Bierman, M.D.	G. G. Deaver, M. D.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	.....	Sept.	$396	Certificate, B. S. or M. S.
University of California Hospital, San Francisco	Frances Baker, M. D.	Mrs. Margery Wagner	(a) R. N. (b) Phys. educ. major (c) Coll. grad.	12 mos.	.....	Oct.	$150	Certificate
University of Iowa, College of Medicine, Iowa City	W. D. Paul, M. D.	Mrs. Olive Farr	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	6 mos.	Mar. and Sept.	None	Certificate
Cleveland Clinic Foundation Hospital, Cleveland, Ohio	Walter J. Zeiter, M. D.	Anna Wetterhuus, R.N.	(a) R. N. (b) Phys. educ. major (c) 2 yrs. coll.	9 mos.	.....	July	None	Certificate
Graduate Hospital, University of Pennsylvania	Wm. T. Johnson, M. D.	Samuel Henshaw	(a) R. N. (b) 2 yrs. coll.	12 months	.....	Sept.	$200	Certificate
Army & Navy General Hospital, Hot Springs National Park, Ark.				.....	6 mos.			
Fitzsimons General Hospital, Denver, Colo.				.....	6 mos.			
O'Reilly General Hospital, Springfield, Mo.				.....	6 mos.			
Brooke General Hospital, San Antonio, Tex.				.....	6 mos.			

* Courses are so arranged that any of the entrance requirements (a, b, c or d) will qualify students for training.
** R = Regular course; E = Emergency course.
1. Male students are admitted.
2. Four year course leads to B. S. degree from Simmons College.
3. This group admitted to emergency course only.
4. Emergency course offered in cooperation with Harvard Medical School.
5. Only those with three years of college are admitted to emergency course.

Reprints

"Physical Therapy as a Vocation"

"Approved Schools of Physical Therapy"

"Training of Physical Therapy Technicians"

The Constitution of the American Physiotherapy Association

Code of Ethics and Discipline of the American Physiotherapy Association

The Blue Booklet, "The American Physiotherapy Association is Organized to Serve"

"What Does a Physical Therapy Department Contribute to a Hospital?"

"A Study of Physical Therapy Costs in Industrial Medicine"

"Role of the Physical Therapist in the Care of the Crippled Child"

"Ethics and the Physical Therapy Technician"

"Bulletin of Information, American Physiotherapy Association"

List of National and Chapter Officers of the American Physiotherapy Association

To obtain any or all of these reprints, address Miss Hazel E. Furscott, Chairman, Relations Committee, 219 Fitzhugh Building, San Francisco, California. Single reprints, 10c; complete set of reprints, 25c. Free to nonmembers.

The
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Editor-in-Chief: MILDRED ELSON

Business Manager: HAZEL PUTMAN

Associate Editors

GERTRUDE BEARD

BESS SEARLS

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Physical Therapy Technicians and the War Effort

Every physical therapy technician who meets the requirements of the Army for physical therapy aide should consider enlisting. The Office of Procurement and Assignment has issued a call for 1,000 trained technicians. This is a large order and we as an association want to fulfil our obligation to our country.

It has come to our attention that some of our members have forsaken their profession and have accepted employment in defense plants. Those who have done this have turned their backs on a profession vitally needed in military and civilian life. There are others not trained who can and should be employed in defense plants. Possibly these technicians would not be eligible for military service, but by continuing their profession in civilian life they release needed technicians for the armed forces. It might be pointed out that employment in many defense industries will terminate with the war and that it is rather short-sighted to give up a profession for jobs that at best will be temporary. As the war continues the need increases. We cannot and must not fail to provide the necessary care for our wounded. Volunteer physical therapy assistants also will help relieve the shortage in physical therapy departments. The Illinois Chapter, with Miss Mary Castle as chairman, has compiled a syllabus to be used in training such volunteers. The American Women's Volunteer Service is sponsoring and cooperating in the program in a manner similar to the American Red Cross Nurses' Aides program which has proven of such value to the nursing service in hospitals. Other chapters should be prepared to help relieve the shortage that will exist, for as vacancies occur there are no technicians to fill them. Graduates of the approved schools are enlisting in the Army or Navy and that source of supply is no longer available for civilian employment.

To summarize: (1) Enlist—your services are vitally needed. (2) Stay in your profession. If you are not eligible for enlistment, you will serve your country best by releasing another for the armed forces. (3) Chapters—make preparations for training volunteer assistants to relieve the technician shortage so that civilian population can be served as adequately as possible.

The American Physiotherapy Association was pleased to receive an invitation from the American Congress of Physical Therapy to join them at their annual meeting in Chicago, September 8-11, 1943. Unfortunately the invitation was not received in time to enable us to accept. Our constitution states that the call for convention must be sent out two months prior to the meeting.

We feel that such a meeting would have been highly desirable and would have promoted further the good understanding and relation which the two associations enjoy. The program* which they assembled was excellent, and it is hoped that some of our members were fortunate enough to have attended.

Opportunity Offered Enlisted WACS to Become Physical Therapy Aides

Opportunity for qualified enlisted members of the Women's Army Corps to become Physical Therapy Aides, serving in the Medical Department of the Army of the United States with the relative rank of second lieutenant, was announced today by the War Department.

Training courses in physical therapy for qualified enlisted WACS will begin in October under the direction of The Surgeon General, who will select the WAC personnel to be trained. On successful completion of the study and 3 months' practice, the WACS will be discharged from the Women's Army Corps and will be appointed as Physical Therapy Aides.

To be eligible, applicants must be under 44 years of age, must have completed the WAC

*See page 215.

basic training and must have a degree in physical education or two years of college study emphasizing the biological sciences.

Successful applicants will receive six months of training in physical therapy in classes at universities and hospitals. On completion of those studies, they will be assigned to selected Army hosptials for practical experience in the treatment of wounded soldiers. The first groups selected will be sent to Leland Stanford University at Palo Alto, California; the University of Wisconsin at Madison, Wisconsin, and the D. T. Watson School of Physical Therapy at the University of Pittsburgh. They will be trained at Government expense and be quartered on or near the university campus. It is expected that Walter Reed General Hospital, Washington, D. C., and other Army hospitals will participate in the training later.

Physical therapy is a major part of the rehabilitation program for the war wounded. During the last war Physical Therapy Aides worked with the Army as civilians, both in this country and overseas. A military status in the Army Medical Department was authorized recently for persons doing this work. Major Emma E. Vogel is the Director of Physical Therapy Aides.

Physical therapy employs massage, exercises and various forms of heat and other externally applied treatment. Understanding of such subjects as physiology and anatomy, as well as skill in the application of such treatments, are required of Physical Therapy Aides.

Poliomyelitis Epidemics: Summer 1943

Poliomyelitis, after first involving southern California, continues an accelerated march across America. It his swung northward from Texas to Oklahoma and Kansas, struck from Kansas into Illinois, jumped to Connecticut and at the same time made further inroads in the states of Washington and Oregon.

According to official figures as of July 31 there were 2,317 new cases of poliomyelitis, reported in the United States this year as against a total of 1,020 cases reported up through the week ended August 1, last year. Unofficial figures for this year as of the first week of August reveal more than 2,700 cases and the total is constantly growing.

A study of the records for the past three years shows that in 1940 the peak of the epidemic was reached September 14; in 1941 the last week of August marked the high spot for new cases reported, and last year the peak occurred the second week of September. Now, the crucial weeks of the 1943 epidemic peak season are at hand.

From "National Foundation News," Vol. 2, No. 10, August 1943.

1942 Conference Reports

The 1942 conference reports are now off the press and may be obtained at the cost of $2 each, from the American Physiotherapy Association, 495 California Avenue, Palo Alto, California. These reports are of value to every physical therapy technician because there is up-to-date information that is not in any textbook. We feel that a copy of this report should be in every physical therapy technician's library, and that every student of phyical therapy also should possess one.

American-Soviet Medical Society

The American-Soviet Medical Society, recently organized to stimulate the exchange of medical information between the United States and the Soviet Union, formally launched its Detroit chapter on August 18, 1943. Professor Vladimar V. Lebedenke of the Department of Surgery at the First Moscow Medical Institute, who at present is in the United States as official representative of the Russian Red Cross, will be the chief speaker. He will describe his experiences with Soviet war medicine and particularly with new methods of treating shock at the front.

Mississippi Valley Medical Society

The 9th annual meeting of the Mississippi Valley Medical Society was held in Quincy, Illinois, September 29 and 30, 1943. A program of intensive postgraduate instruction, conducted by well known clinician-teachers, was arranged especially to appeal to physicians in general practice.

Correction

An error was made in a news item which appeared in the July-August issue of the Review. Miss Brunetta Kueblthau is not a nurse but is the only Medical Department Physical Therapy Aide who is a Japanese prisoner. She majored in physical education at the University of Wisconsin and graduated from the physical therapy course conducted at Walter Reed General Hospital.

A pamphlet, "Nursing Care of Patients with Infantile Paralysis—Including Nursing Aspects of the Kenny Method: A Guide for Nurses," has been prepared by the Joint Orthopedic Nursing Advisory Service together with a committee of agencies working with the Division of Physically Handicapped Children of the New York City Department of Health. Diagrams for the placing and cutting of packs are included. A brief "Guide for Parents" also has been prepared. These pamphlets are being published by the National Foundation for Infantile Paralysis for general distribution. Free copies may be obtained by writing to the Foundation, 120 Broadway, New York 5, New York.

National Society for Crippled Children

President Palmer announces that the Board of Trustees has voted to dispense with the 1943 annual meeting of the National Society for Crippled Children.

This action has been taken in compliance with the wishes of the Office of Defense Transportation which has requested the cancellation of all meetings not essential to the war effort.

Prisoner of War

A clipping from the "Re-Aides Post," Summer 1943, gives us some news of Mary (Mollie) McMillan. She had started home and had reached Manila when Pearl Harbor was bombed, and she became a Japanese prisoner, interned for several months at Santo Tomas University. The Red Cross then stated that in September she was taken back to China, to Shanghai, reaching there in October. We heard that she was living at the home of Dr. Dunlap, but now read in the papers that all Americans in Shanghai have been interned. Last summer we heard that letters could be sent to her through the Red Cross, as "Prisoner of War," but all letters came back. Her sister writes to the China Medical Board and hopes that messages get through, but she does not know. The only address available is:

Civilian Internee Mail Postage Free
Miss Mary McMillan—American Internee
Interned by Japan
Formerly of Shanghai
Care of Japanese Red Cross
Tokyo, Japan.

Edna L. Foley

Physical therapy as well as the nursing profession has lost a friend in the death of Edna L. Foley, which occurred at the home of her sister in New York City, on August 4, 1943.

Miss Foley was a graduate of Smith College and of the Hartford Hospital Training School for Nurses in Hartford, Connecticut. After a variety of nursing experience she came to the Visiting Nurse Association of Chicago as Superintendent in 1912 and, except for a year's leave of absence in 1919 when she was chief nurse of the American Red Cross Tuberculosis Commission to Italy, she remained in this position until her retirement in 1937.

Miss Foley's interest in the care of patients with orthopedic conditions dates from her early hospital experience in Boston and Albany and was heightened by the infantile paralysis epidemic of 1916. She was quick to recognize the responsibility of the public health nursing agency for the home follow-up of these patients and under her leadership the orthopedic service of the Visiting Nurse Association of Chicago was established. She firmly believed that nurses assuming responsibility for muscle reeducation should have adequate instruction and since in those times there were no approved schools of physical therapy, she secured a physical therapist experienced in the care of infantile paralysis patients as instructor on the staff. Later when physical therapy courses were established she encouraged members of her staff to qualify in this field. Her advice frequently was sought by other public health nursing agencies who inaugurated similar programs. She was keenly interested in the organization of the Chicago Chapter of the A.P.A. and was made an honorary member, first of the Chicago Chapter, and later of the national association.

In June 1928 Smith College conferred upon Miss Foley the degree of Doctor of Science. In conferring it President Neilson described her as "a skilled nurse and teacher of nurses, a wise and rigorous administrator, an authority on public health and social welfare, a large hearted and keen sighted student of human nature."

In December 1934 the Institute of Medicine of Chicago made her a "Citizen Fellow" in appreciation of her efforts to improve civic, social and health conditions in Chicago.

Those who knew Miss Foley casually felt the warmth of her friendliness. Those who had the privilege of working with her always will think of her as a beloved leader and friend.

Robert Lide Carroll, M. D., of Los Angeles, California, died on June 7, 1943, at the age of forty-eight. Doctor Carroll was Orthopedic Consultant for the County Hospital, Arlington, California; Chief of the Orthopedic Service at the California Hospital, Los Angeles; and a member of the Professional Advisory Committee of the Crippled Children Services for the State of California, as well as in the Orthopedic Hospital. He was greatly interested in corrective physical education, and recently completed a follow-up survey of poliomyelitis cases, which was conducted under a grant from the National Foundation for Infantile Paralysis. In this latter project he studied 1,767 cases and personally reexamined 850 patients. Doctor Carroll has contributed many articles to THE PHYSIOTHERAPY REVIEW, the latest of which was "Rate and Amount of Improvement in Muscle Strength Following Infantile Paralysis" which appeared in the September-October 1942 issue.

Murray Snell Danforth, M. D., died on June 5, 1943 after having been editor of THE JOURNAL OF BONE AND JOINT SURGERY for only a few months. He was highly regarded as a consultant and worked unceasingly for the improvement of orthopedic treatment.

Mr. and Mrs. Donald Cleaveland of Palo Alto, California, became the parents of a son, Richard John, on March 22, 1943. Mrs. Cleaveland formerly was secretary to the Executive Committee of the Association.

Mr. and Mrs. James W. Eckersley of Chicago, Illinois, are the parents of a son, William White, born July 1, 1943. Mrs. Eckersley is business secretary to the REVIEW.

American Congress of Physical Therapy

The 22nd annual convention of the American Congress of Physical Therapy was held at the Palmer House in Chicago, Sept. 8-11, 1943. The program was as follows:

GENERAL SCIENTIFIC SESSION

WEDNESDAY, September 8, 11 A. M.

Chairman—ORA L. HUDDLESTON, Denver, Colo.

Fever and Sulfadiazine Therapy in Resistant Gonorrhea.

SIDNEY LICHT, Capt., M. C. Chief, Physical Therapy Section, Lovell General Hospital, Fort Devens, Mass.,

and

VERNON S. DICK, Capt. M.C. Chief, Urology Section, Lovell General Hospital, Fort Devens, Mass.

The Reduction of Man Power Loss from Gonorrheal Urethritis by the Early Application of Chemo-Fever Therapy.

LT. COMDR. KENNETH PHILLIPS, (M.C.) U. S. N. R.;

and

ENSIGN ALICE B. MUNDORFF, (N.C.) U. S. N. R.

Renal Complications in Combined Sulfathiazol-Fever Therapy.

ARTHUR PRUCE, 1st Lt., M.C., Chief Physical Therapy Section, Stark General Hospital, Charleston, S. C.

WEDNESDAY, September 8, 2:30 P. M.

Chairman—JOHN S. HIBBEN, Pasadena, Calif.

Radiant Disinfection: Part II. Practice.

WILLIAM FIRTH WELLS, Associate Professor in Research in Air-borne Infection, Laboratories for the Study of Air-borne Infection, The School of Medicine, University of Pennsylvania, Philadelphia.

Discussion opened by Howard A. Carter, B.S. in M.E., Chicago.

A Preliminary Report of Results Observed in Eighty Cases of Intractable Bronchial Asthma.

GEORGE PETRIE MILEY, M.D., D. Sc. (Med.) Clinical Professor of Pharmacology, Hahnemann Medical College and Hospital; Director, Blood Irradiation Clinic, Hahnemann Hospital, Philadelphia;

RAYMOND EDWIN SEIDEL, M.D., Associate in Department of Pharmacology. Hahnemann Medical College, Philadelphia;

JENS ALLEN CHRICTENSEN, M.D., Research Associate, Department of Pharmacology, Hahnemann College, Philadelphia

Discussion opened by G. J. P. Barger, M. D., Washington, D.C.

Refrigeration.

ROBERT TALBOT McELVENNY, M.D., Associate Surgeon, Northwestern University Medical School; Attending Orthopedic Surgeon, Wesley Memorial Hospital, Chicago.

Discussion opened by M. K. Newman, M.D., Detroit.

Cold Allergy.

BAYARD T. HORTON, M.D., Head of Section of Clinical Investigation, The Mayo Clinic; Associate Professor of Medicine, The Mayo Foundation, University of Minnesota, Rochester, Minnesota.

Modern Hydrotherapy. II. A Review of Recent Developments.

HANS J. BEHREND, M. D., Lecturer, Physical Therapy, School of Education, New York University; Associate, Physical Therapy, Hospital for Joint Diseases, New York, N. Y.
Discussion opened by Robert Bennett, M.D., Warm Springs, Ga.

DEMONSTRATION

WEDNESDAY, September 8, 5 P. M.

Exercise for Scoliosis.

FRANCIS BAKER, M. D., Director of Department of Physical Therapy, University of California Hospital, San Francisco.

EVENING SESSION

WEDNESDAY, September 8—8 P. M.

Chairman—FRED B. MOOR, Los Angeles.

FORMAL OPENING OF THE 22ND ANNUAL SESSION

INVOCATION

Adalbert R. Kretzmann,
Pastor, The Church of Saint Luke, Chicago

ADDRESS OF WELCOME

Edward J. Jelly
Mayor, City of Chicago
Herman L. Kretschmer, M.D
President-Elect, American Medical Association
George W. Post, M.D.
President, Illinois State Medical Association
Oscar Hawkinson, M.D.
President, Chicago Medical Society
Raymond B. Allen, M. D.
Dean, University of Illinois College of Medicine
Stewart C. Thompson, M.D.
Assistant Dean, Loyola University School of Medicine
J. Roscoe Miller, M.D.
Dean, Northwestern University Medical School.

INDUCTION OF PRESIDENT-ELECT

ADDRESS

Physical Therapy in War Times

Kristian G. Hansson, M. D., New York, N. Y.

Physical Therapy in Medical Education.

EBEN J. CAREY, M.D., Dean, Marquette University, School of Medicine, Milwaukee, Wisconsin.

Medical Rehabilitation in the Veterans Administration.

FRANK T. HINES, Brig. General, Administrator, Veterans Administration, Washington, D. C.

GENERAL SCIENTIFIC SESSION

THURSDAY, September 9, 11 A. M.

Chairman—WALTER S. MCCLELLAN, Saratoga Springs, N. Y.

Rehabilitation of Arthrogryposis Multiplexa Congenita.

CARL EGBERT BADGLEY, M.D., Professor of Surgery in charge of Orthopedic Surgery, University of Michigan Medical School, Ann Arbor, Michigan.

Management and Care of Infantile Paralysis Patients.

EDWARD LYON COMPERE, M.D., Associate Professor, Northwestern University Medical School; Attending Orthopedic Surgeon and Chairman of the Department of Orthopedic Surgery, Wesley Memorial Hospital, Chicago.

The Interpretation and Clinical Significance of Calorimetric and Skin Temperature Measurements of the Extremities.

CHARLES SHEARD, Ph. D., Professor of Biophysics, Mayo Foundation, University of Minnesota and Director of Division of Physics and Biophysical Research, The Mayo Clinic, Rochester, Minn.;
GRACE M. ROTH, Ph. D., Instructor in Physiology, Mayo Foundation, University of Minnesota and Associate in Clinical Physiology, The Mayo Clinic, Rochester Minn.;
and
EDGAR V. ALLEN, M. D., Associate Professor of Medicine, Mayo Foundation, University of Minnesota and Head of Section of Medicine, The Mayo Clinic, Rochester, Minn.

GENERAL SCIENTIFIC SESSION

THURSDAY, September 9, 2:30 P. M.

Chairman—WILLIAM H. SCHMIDT, Philadelphia, Pa.

Rehabilitation, Prehabilitation and Placing the Recovered Workman.

MADGE C. L. McGUINNESS, M.D., Director, Department of Physical Therapy, Lenox Hill and Misericordia Hospitals, New York, N. Y.
Discussion opened by Nathan H. Polmer, M. D., New Orleans.

Rehabilitation—Opportunities for Psychotherapy in Physical Therapy.

ALFRED P. SOLOMON, M.D., Associate Professor, Psychiatry, University of Illinois College of Medicine; Senior Attending Neuropsychiatrist, St. Luke's Hospital, Chicago.
Discussion opened by Disraeli Kobak, M.D., Chicago.

Rehabilitation of Injured Workers in Small Plants.

EDWARD C. HOLMBALD, M.D., F.A.C.S., Managing Director, American Association of Industrial Physicians and Surgeons; Senior Attending Surgeon, St. Luke's Hospital, Chicago.
Discussion opened by Frances Baker, M.D., San Francisco.

Sudeck's Atrophy—A Chronic Vasodilator Mechanism.

GEZA de TAKATS, M.D., Associate Professor of Surgery, University of Illinois College of Medicine; Senior Attending Surgeon, St. Luke's Hospital, Chicago.

Discussion opened by Earl C. Elkins, M. D., Rochester, Minn.

Mechanics in Relation to Derangement of the Facet Joints in the Spine.
JESSIE WRIGHT, M.D., Director, D. T. Watson, School of Physical Therapy, Leetsdale, Pittsburgh, Pa.
Discussion opened by Henry H. Jordan, M.D., New York.

DEMONSTRATION

THURSDAY, September 9, 5 P. M.

Foot Exercises.
HANS J. BEHREND, M. D., Lecturer, Physical Therapy, School of Education, New York University; Associate, Physical Therapy, Hospital for Joint Diseases, New York, N. Y.

ANNUAL CONGRESS DINNER (INFORMAL)

THURSDAY, September 9—7 P. M.

TOASTMASTER: KRISTIAN G. HANSSON, M.D., *President.*

GENERAL SCIENTIFIC SESSION

FRIDAY, September 10, 11 A. M.

Chairman—A. R. HOLLENDER, Chicago.

Some Thoughts About Shock Therapy.
CLARENCE A. NEYMANN., M.D., Chief of Staff, Cook County Psychopathic Hospital, Chicago.

Electric Shock Therapy, Its Indications and Use.
JOSEPH G. RUSHTON, M.D., First Assistant in Department of Neurology and Phychiatry, Mayo Foundation, Rochester, Minnesota.
and
JOHN A. AITA, M.D., Instructor in Neurology and Psychiatry and First Assistant in Department of Neurology and Psychiatry, Mayo Foundation, Rochester, Minnesota.

Histamin Ion-Transfer. A Five Year Evaluation.
IRVIN F. HUMMON, Jr., M. D., Attending Physician, Department of Physical Therapy, Cook County Hospital; Assistant Professor Physical Therapy, Department of Physiology, Pharmacology and Therapeutics, Loyola University School of Medicine, Chicago.

GENERAL SCIENTIFIC SESSION

FRIDAY, September 10, 2:30 P. M.

Chairman—MILAND E. KNAPP, Minneapolis, Minnesota.

Common Foot Disorders: Rehabilitation with Physiologic Exercises.
EMIL D. W. HAUSER, M.D., Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School; Attending Orthopedic Surgeon, Passavant Memorial Hospital, Chicago.
Discussion opened by Jerome Weiss, M. D., New York, N. Y.

Symposium on Rehabilitation in the Armed Forces.
Use of the Convalescent Ward in the Rehabilitation and Disposition of Disabled Soldiers.
ORA L. HUDDLESTON, Major, M.C. Physical Therapy Section, Fitzsimons General Hospital, Denver, Colorado.

Rehabilitation of War Wounded in a Physical Therapy Department of a Navy Hospital.
JACOB LOUIS RUDD, Lt. Comdr. MC-V (S), U. S. N. R., In Charge, Department of Physical Medicine, U. S. Naval Hospital, Philadelphia.

Peripheral Nerve Injuries.
ROBERT E. KINNEMAN, Lt. Comdr., (MC), U. S. N. R., U. S. Naval Hospital, Great Lakes, Ill.

Organization, Management and Operation of a Navy Physical Therapy Department.
LOUIS B. NEWMAN, Lt. Comdr. MC, U. S. N. R. Head, Department of Physical Medicine, U. S. Naval Hospital, Oakland, Calif.

Fever Therapy in Chemoresistant Gonococcus Infection—An Analysis of 150 Consecutive Cases.
GORDON M. PERISHO, Lt. Comdr,. (M.C.) U. S. N., U. S. Naval Hospital, Naval Operating Base, Norfolk, Va.
Discussion of foregoing papers to be opened by Lt. Col. Norman E. Titus, M.C., Atlanta, Ga.

DEMONSTRATION

FRIDAY, September 10, 5 P. M.

Manipulation of the Back
JESSIE WRIGHT, M.D., Director, D. T. Watson School of Physical Therapy, Leetsdale, Pittsburgh, Pa.

GENERAL SCIENTIFIC SESSION

FRIDAY, September 10, 8 P. M.

OFFICERS OF THE SECTION

Chairman—FRANK H. EWERHARDT, St. Louis, Missouri.

The Treatment of Shock, With Special Reference to Heat and Cold.
WARREN H. COLE, M.D., Professor and Head of the Department of Surgery, University of Illinois College of Medicine, Chicago.

Rehabilitation in Head and Back Injuries.
HARRY E. MOCK, M.D., Associate Professor, Surgery, Northwestern University Medical School, Chicago.

Physical Rehabilitation and the War.
FRANK H. KRUSEN, M.D., Professor of Physical Medicine, Mayo Foundation, University of Minnesota; Head of the Section on Physical Medicine, The Mayo Clinic, Rochester, Minnesota.

EDUCATIONAL CONFERENCE

SATURDAY, September 11, 9 A. M.

HOSPITAL CLINICS

SATURDAY, September 11—9 to 12 Noon

Index to Current Literature

Allergy

Food Allergy. G. A. NITSHE, JR., M. D., Hahnemannian Monthly, July 1943.

Amputations

Refrigeration Anesthesia in Amputations. HARRY E. MOCK, M. D. and LIEUT. HARRY E. MOCK, JR., M. C., A.U.S. J.A.M.A., Sept. 4, 1943.

Anterior Poliomyelitis

Insect Vectors of Poliomyelitis. Editorials, J.A.M.A., Aug. 28, 1943.

Poliomyelitic Degeneration of Motor End Plates. Current Comment, J.A.M.A., Aug. 28, 1943.

The Poliomyelitis Situation. Current Comment, J.A.M.A., Aug. 21, 1943.

The 1942 San Antonio Poliomyelitis Epidemic. WALTER G. STUCK, M. D., and MAJOR A. O. LOUISELLE, M. C., A.U.S. J.A.M.A., July 24, 1943.

The Use of Prostigmine in the Treatment of Poliomyelitis. HERMAN KABAT, M. D., and MILAND E. KNAPP, M. D. J.A.M.A., Aug. 7, 1943.

The Kenny Treatment for Infantile Paralysis: A Comparison of Results with Those of Other Older Methods of Treatment. ROBERT BINGHAM, M. D. J. BONE and J. SURG., July 1943.

The Influence of the Kenny Concept of Acute Poliomyelitis on the Physical Treatment Throughout All States of the Disease. ROBERT L. BENNETT, M. D. Arch. P. T., Aug. 1943.

Analysis of Treatment of Infantile Paralysis: With Comments on Kenny System. A. M. RECHTMAN, M. D. Arch. P. T., Aug. 1943.

The Kenny Versus the Orthodox Treatment of Anterior Poliomyelitis. J. ALBERT KEY, M. D. Surgery, July 1943.

Asthma

Galvanism for Bronchial Asthma. J. Chart. Soc. M. & M. Gym., July 1943.

Burns

A Statistical Study of Industrial Burns. ROY D. MCCLURE, M. D., and CONRAD R. LAM, M. D. J.A.M.A., July 31, 1943.

Treatment of Surface Burns. Editorials, J.A.M.A., July 24, 1943.

Dermatology

Irradiation Treatment of Some Common Skin Conditions. WM. BEAUMONT. Brit. J. Phys. Med. and Industrial Hygiene, July-August 1943.

Functional Factors in Common Dermatoses. MAXIMILIAN E. OBERMAYER, M. D. J.A.M.A., July 23, 1943.

Exercise

Principles of Exercise Therapy. J. CHART. SOC. M. and M. Gym., July 1943.

Early Postoperative Walking: Collective Review. BERNARD NEWBURGER, M. D. Surgery, July 1943.

Foot Conditions

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ABSTRACTS

John S. Coulter, M.D.

Paralytic Scoliosis

Aladar Farkas, M. D., Iowa City, Iowa. In JOURNAL OF BONE AND JOINT SURGERY, XXV:3:581, July 1943.

During the epidemic of infantile paralysis in the State of Iowa in 1940, 264 patients with this disease were admitted to the Orthopedic Department of the State University of Iowa. In more than 100 cases, as soon as the condition of the patient permitted, roentgenograms of the spine were taken, regardless of the muscle involvement and the severity of the disease. The examination and evaluation of this material (Early Series) and its comparison with more than 100 cases in previous epidemics (Late Series) form the basis of the paper.

The author observes that in most cases from four to five years are necessary for the complete development of paralytic scoliosis. Only after that period can a scoliotic curve be regarded as mechanically final; this also marks the end of the early stage.

A few weeks or months after the onset of infantile paralysis, the spine discloses changes representing a pathological entity—the paralytic spine. This process can be subdivided into several stages characterized by (1) morphological and (2) functional signs.

(1) At the onset enlargement of the intervertebral spaces is observed, followed later on by dullness and cloudiness, the border lines between discs and vertebrae are effaced, and the spaces themselves become uneven and appear markedly narrowed. Ossification of the epiphyseal ring starts in some cases as early as the age of four; the process is very irregular, and the ossification is bulky and confluent. Minute or larger calcium deposits appear in the intervertebral spaces. This process may last for years, accompanied by general bone atrophy; in many cases after a couple of years the process apparently heals spontaneously.

(2) Functionally the paralytic spine is characterized by a high degree of flexibility and compressibility. Because of the increased mobility, univertebral or segmental rotations appear first without any lateral deviation. Due to the flexibility, forward-backward tilting of one or more vertebrae occurs with the disappearance of thoracic kyphosis and lumbar lordosis. As a result of the increased mobility and compressibility—the prime factor in the formation of scoliosis—a translatory shift of the vertebrae appears.

The paralytic spine is the pathological condition preceding paralytic scoliosis. The scoliotic curve requires usually from four to five years before reaching its final form. Prior to this, the side of the convexity and the direction of the rotation may change several times. The rotation and compression of the spine are the chief factors in preparing the way for paralytic scoliosis.

The rotation is brought about by faulty mechanics of (a) the pelvis (pelvic rotation); (b) the thorax and shoulder girdle (thoracic rotation); and (c) the respiration.

In pelvic rotation all spinous processes point to the same side of the body. In thoracic rotation, the thoracic and the lumbar spinous processes point in opposite directions.

The cause of rotation is the pathological imbalance between the two sides of the body in carrying out rotary motion of different degrees during the performance of the daily routine, especially during locomotion. The physiological imbalance, present in every human being, takes advantage of the decreased resistance of the rotary system of the spine—that is, damage of the discs—and causes the predominance of the right thoracic, left lumbar curves.

Paralytic scoliosis is brought about by the imbalance between the two sides of the body exerted on the paralytic spine. Paralytic scoliosis can be differentiated from scoliosis of any other etiology by the uniform density of the spine in the roentgenogram, by the excessive and early rotation of the vertebrae, and by the temporary concave rotation.

Curves resulting from pelvic rotation, except for the sitting curves, have a far better prognosis than the thoracic curves, especially if the latter are associated with respiratory disturbances.

The Use of Prostigmine in the Treatment of Poliomyelitis

Herman Kabat, M. D., Ph. D., and Miland E. Knapp, M. D., Minneapolis. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 122:15:989, August 7, 1943.

In recent years radical changes in the therapy of poliomyelitis have been advocated which have stimulated reinvestigation of the pathologic physiology of the disease. "Muscle spasm" and "incoordination" have been shown to be frequent and prominent symptoms of poliomyelitis.

Experimental studies on the mechanism of these phenomena have demonstrated that they have a neuro-

genic basis. The muscular rigidity and hyperirritable stretch reflexes disappeared temporarily during spinal anesthesia in patients with poliomyelitis. These studies suggest that muscle spasm may be the result of changes produced in the gray matter of the spinal cord by the virus invasion. This view is corroborated by electromyographic recordings from hypertonic muscles in cases of poliomyelitis.

An analysis of available sections of the spinal cord from 78 patients with poliomyelitis who died in the acute stage of the disease has revealed that inflammation about the internuncial neurons in the gray matter of the spinal cord occurred in almost every case and that injury to internuncial neurons appeared to be prominent in many cases. On the other hand, little or no injury to anterior horn cells was observed in about 40 per cent of the cases, while the other 60 per cent showed more or less pronounced destruction of the large motor neurons.

The effects of prostigmine on muscle function in poliomyelitis have been studied in a series of 24 patients ranging in age from 2 to 46 years. The time from the onset of paralysis varied from three weeks to seventeen months.

Summary and Conclusions

1. Prostigime decreases skeletal muscle hypertonus and proprioceptive reflex hyperirritability ("muscle spasm") in patients with poliomyelitis. It also reduces "incoordination." These effects may be evident one hour after subcutaneous administration of the drug. These actions of prostigmine apparently depend upon alteration of function of synapses in the spinal cord and are not antagonized by atropine.

2. Prostigmine has been given a preliminary trial as an adjunct in the treatment of poliomyelitis. The approach to therapy has been based on the Kenny concept of the disease. In a series of 20 patients, most of whom were in the subacute stage of the disease, the results have been encouraging. The drug significantly increased the range of passive motion, decreased or eliminated deformities in some instances by relaxation of hypertonus and in some cases improved active motion. In a number of instances muscle spasm has shown more rapid improvement when prostigmine was added to the Kenny routine. In a majority of cases the drug appeared to accelerate recovery.

Passive Hyperemia for Chilblains

H. Herxheimer. In LANCET, 2:640, November 28, 1942. Abst. J.A.M.A., 121:10:792, March 6, 1943.

Herxheimer produced artificial hyperemia by Bier's method of applying a constricting rubber bandage at the middle of the humerus or femur of 24 persons suffering from chilblains. Most of the patients were school boys; the treatment of 21 was completely successful in five to seven days: swelling, pain and itching disappeared and small ulcers and cracks of the skin healed. The only remaining sign was redness of the skin, sometimes associated with thickening and wrinkling. In spite of this early success, treatment was continued for at least six weeks because if it was interrupted after a week or a fortnight the chilblains recurred at once, but did not after the prolonged period of treatment. A Martin's bandage 2½ to 3 inches wide was used, but any other elastic bandage, even bandages made without rubber, will do. The color of the limb should deepen under its influence but it should not become colder to the touch than it was before, and the feeling of pins and needles should not ensue. On the other hand the constriction should be so firm that the sensation and coldness are only just avoided. A reliable sign of correct technic is that the big veins in the elbow protrude and that the arm is deep purple without being uncomfortable. In some cases swelling of the hand, a sign of too firm bandaging, is visible next morning, but this subsides in a few hours. The bandage may be left in position for twenty-two out of the twenty-four hours, but usually all night treatment is sufficient. The beneficial effects of this local venous congestion is not easily understood. It seems that the unhindered arterial inflow forces blood through all potential blood spaces in the limb, including the capillary spaces dilated (and paralyzed) by cold, thus reopening the circulation through them.

Vocational Rehabilitation Act

Editorial, THE CRIPPLED CHILD, Vol. XXI, No. 2, August 1943.

After more than a year's deliberation Congress passed the bill, amending the vocational rehabilitation act of 1920, and it became a law on June 6 when President Roosevelt affixed his signature to it.

Injuries to civilian defense workers have increased 70 per cent as war production has expanded and these cases coming before the rehabilitation service, in addition to its normal case load, have of necessity increased tremendously the strain on personnel and finances as regulated by the 1920 act. There are even now, and this number unfortunately will increase, men in the armed forces who will not be able to establish service-connected disabilities, who will have to be cared for under this Federal-State law instead of under the disabled veterans' legislation administered through the U. S. Veterans' Administration.

Only one plan is required of the state for Federal approval instead of one each year as formerly. The present act contains provision for necessary medical and surgical treatment. This action is long overdue, for this phase of the program has been completely overlooked except in a few states, not because rehabilitation officers did not recognize the need for it, but largely because appropriations have been inadequate in most states for carrying on a complete program.

The entire cost of administration is to be borne by the Government and does not have to come out of the matching funds of the states as heretofore. In addition the Federal Government will pay all costs of necessary medical treatment and rehabilitation for war disabled civilians. The 50-50 matching plan still applies to all other disabled civilians.

The Influence of the Kenny Concept of Acute Poliomyelitis on the Physical Treatment Through All Stages of the Disease

Robert L. Bennett, M. D., Director of Physical Medicine, Georgia Warm Springs Foundation. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 8, August 1943.

Those who care for the after-effects of poliomyelitis in all its stages constantly are faced with the question of whether the acceptance of the Kenny concept of the clinical manifestations in the acute stage of the disease necessitates drastic changes in all our old routines throughout the entire period of the patient's rehabilitation.

The Kenny concept maintained that the dominant factor responsible for the crippling effects of poliomyelitis was not a flaccid paralysis due to destruction of lower motor neurons, but actually a hypertonicity and irritability of the involved muscles setting up a sequence of events leading to apparent loss of voluntary contraction in muscles opposing the muscle in "spasm." This concept pointed out that contractural deformities of involved segments result from the sustained pull or continued hyperirritability of these muscles and not from the tonic pull of a normal muscle against a paralyzed one. Thus, the syndrome characterized by muscle "spasm," "alienation" and "incoordination" (to use Miss Kenny's own terms), which if untreated goes on to widespread contractures and apparent paralysis, is, in effect, an entirely new disease entity—new even to the extent that it probably arises from a lesion or lesions distinctly apart from damage to anterior horn cells.

The author concludes that while the full acceptance of the Kenny concept is hampered by poor terminology and by our limited knowledge of many of the basic physiologic and pathologic facts responsible for the cause and the after-effects of poliomyelitis, it is proving itself clinically sound. In the acute stage of the disease this concept presents a syndrome of clinical manifestations which may lead to widespread weakness and deformity unless immediately recognized and treated. No one of these clinical manifestations is new in the sense that it had never been seen before, but the full significance of the triad making up the syndrome had not previously been appreciated. It is evident that, since we had not been aware of the full significance of these clinical findings, our past forms of treatment are likely to be inadequate and must either be discarded or be modified in ways consistent with the new concept. We must not confuse the Kenny concept with the Kenny method. The Kenny concept is a presentation of clinical findings in the acute stage of the disease. The Kenny method is an attempt to treat these findings.

In the convalescent stage the concept explains the cause of the development of contractural deformities and the spotty return of muscle power, and in this way indicates certain routines of treatment. These routines may be similar to those used in the past, but the reasons for their use may be quite different. In this stage there must be no temporizing in the face of beginning periarticular and intramuscular contractures. We must not sit idly and hope that hot packs will dissolve the contractures in some magical manner. If they do not quickly respond to conservative measures they must be stretched out manually or even wedged out in plaster casts. We have long known the danger of allowing patients to bear weight and increase their activity unless correct structural alignment can be maintained. When the patient's activity should be increased and protective or supportive apparatus is indicated, such apparatus should be utilized as long as is necessary. Our statistical results may suffer but our patients will not.

In the chronic phase of the disease the concept helps explain the results and perhaps points out the inadequacies of past treatment, but it solves the treatment problem in no way.

Cerebral Birth Palsy with Special Reference to Physical Therapy

Paul R. Lipscomb, M. D., Fellow in Orthopedic Surgery, the Mayo Foundation, and Frank H. Krusen, M. D., Section on Physical Therapy, The Mayo Clinic, Rochester, Minn. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 6, June 1943.

It has been only in the past ten or fifteen years that patients suffering from cerebral palsy have been receiving the attention which they so rightfully deserve. Seven to 10 children per 100,000 of general population are born each year with cerebral palsy. Therefore, the importance of this condition among the crippling diseases is second only to that of infantile paralysis; and as methods for prevention of the latter disease are further developed, it is probable that cerebral birth palsy will rank first among the crippling diseases of childhood.

There are essentially two types of cerebral birth palsy, the pyramidal and the extrapyramidal, which are to be distinguished from each other. We speak of spasticity in this report as a manifestation of the pyramidal type of birth palsy and assume that this is due to destruction of the motor cortex. This is characterized by increased resistance to passive manipulation. In the extrapyramidal or basal ganglion type of rigidity, the quality of resistance is different from that associated with the pyramidal type of birth palsy and the specific reflex changes are not conspicuous.

In an attempt to evaluate the results of therapy as prescribed at the Mayo Clinic, we have studied 168 consecutive cases encountered in the years 1936 and 1937.

The distribution according to sex was about even; 55.6 per cent of the patients were males and 44.4 per cent were females. Treatment is started entirely too late in most instances. The laity and the medical profession should be informed of this fact. In more than 50 per cent of cases all extremities are involved to some degree, and therapy should be instituted with this in mind. The mental status of the patient too

readily is condemned by some examiners. As the patient improves physically, improvement in mentality and speech can be expected.

Although treatment for the pyramidal syndrome differs from that for the extrapyramidal syndrome, there are certain basic principles that hold for both. There is a psychic factor which must be taken into account in all cases. Surgical procedures should be individualized in all instances. These are best performed by an orthopedic surgeon who has had considerable experience with cases of cerebral birth palsy. Operation has little to offer for the athetoid type. Proper physical therapy after operation may be more important than the operation per se. Braces definitely are contraindicated in most instances. The cooperation of the parents is essential.

One of the most important factors in the treatment of cerebral birth palsy is a proper regimen of continued physical therapy. If this is carried out faithfully over a period of years, appreciable improvement can be expected in at least 63 per cent of patients not too deficient mentally whereas only 20 per cent will show appreciable improvement if treatment is not carried out regularly.

A Statistical Study of Minor Industrial Burns

Roy D. McClure, M. D., and Conrad R. Lam, M. D., Detroit. In J.A.M.A., 112:14:909, July 31, 1943.

Much has been written on the subject of burns during the past decade and a half, and a large amount of laboratory and clinical investigation has been carried out. Nevertheless at the present time there is no method of local treatment which is accepted as standard by those who take care of these injuries.

It has been suspected that there has been considerably less standardization of the treatment of minor burns, such as are seen frequently in industrial plants.

A study was made which brought out the striking fact that no less than eighty-four different substances were used in the treatment of the burns included in this experiment. Many of these remedies were proprietary preparations, some of which were adequately described on the labels or advertising literature; others were described ambiguously. There were several different brands of certain more or less standard substances, such as tannic acid jelly and vitamin ointments. Each brand was tabulated separately, which helped to swell the list of different materials to the high figure just mentioned.

In the treatment of such small injuries the aim should be to (1) prevent disability (get the man back on the job in a matter of minutes), (2) relieve pain, (3) prevent or minimize infection and (4) favor early healing, with a minimum of dressings. These objectives are different in many ways from those which are borne in mind when treating the serious burn in the hospital. In this instance the problem is to save the patient's life, which involves considerations of shock due to plasma loss, serious infection, scarring and contractures.

Summary and Conclusions

1. An unreasonable number of different preparations are being used for the treatment of minor burns in industrial plants.

2. Regardless of what is put on the average minor industrial burn, it is apt to be healed in less than a week.

(3) The authors recommend the following treatment for minor industrial burns:

(a) Wash the area with white soap and water.

(b) Do not break blisters or otherwise "debride" the wound.

(c) Cover with fine mesh gauze impregnated with petrolatum or 5 per cent boric acid ointment.

(d) Apply a firm dressing over this, bulky enough to keep dirt away from the injury but not too large to keep the man off his job.

The Sacro-Iliac Joint and Pain of Sciatic Radiation

Charles D. Hershey, M. D., Ann Arbor, Mich. In THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 122:15:983, August 7, 1943.

The cause of pain of sciatic radiation has long been a subject of investigation, and the causative factors advanced for this condition are legion. The author's purpose in this paper is to present the anatomy of this region and the data relating to the arthritic changes in the sacro-iliac joint as determined by dissections on 64 cadavers.

In this study the anterior sacro-iliac regions of 64 embalmed bodies were dissected. The relationship of the lumbosacral trunk to the sacro-iliac joint was determined in all specimens and the degree of arthritic lipping of the joint was noted and classified as to severity.

The conclusions of the study showed:

1. The lumbosacral trunk was in direct contact with the sacro-iliac joint at the point at which it traverses the joint in its lower one-third in all of the 64 specimens studied.

2. The upper portion of the origin of the pyriformis muscle was found to lie medial to the lumbosacral trunk in this study and never to lie between the trunk and the joint.

3. Hypertrophic arthritis in the form of severe spur formation on the anterior line of the sacro-iliac joint was found to be present in 25 per cent of the bodies that were studied. Most of these were considered capable of producing direct irritation of the lumbosacral trunk.

4. Hypertrophic sacro-iliac arthuritis is more frequently found in the older age groups but often is encountered in younger persons.

5. Hypertrophic lipping of the joint in its lower one-third where the lumbosacral trunk crosses it can be determined readily by anteroposterior roentgenograms of the pelvis.

Analysis of Treatment of Infantile Paralysis: With Comments on Kenny System

A. M. Rechtman, M.D., F.A.C.S., Philadelphia. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 8, August 1943.

Much publicity has been given in the past year or two to the Kenny treatment for infantile paralysis in its acute stage. As a result there has been considerable controversy as to the relative merits of this system versus the former method of treatment, which Miss Kenny refers to as the "orthodox" method.

In considering the merits of the two systems of treating patients with infantile paralysis in the acute stage at the Betty Bacharach Home, the workers, physical trerapists, occupational therapist, nurses and nurses' helpers were carefully trained in the treatment of patients in the acute stage of infantile paralysis. Since the advent of the Kenny system, a guide was prepared for their direction, and the workers in charge have taken several courses in the Kenny system, both for their own knowledge in treating patients and for training the personnel in this so-called "newer" method. The author, as director of the work, has been interested in the study of infantile paralysis for two decades and has studied not only the orthodox but the Kenny system.

Scientists, anatomists, pathologists and authorities on infantile paralysis still are studying, observing and evaluating the Kenny system. A comparison of the results obtained in our present cases, in which treatment is by the Kenny system, with those of the past may help provide an answer as to the superiority of one method or perhaps as to the most valuable phases of each. As previously stated, there are relatively few workers who have treated any great number of patients with infantile paralysis over a long period, and the author knows of no school in Philadelphia which majors in training workers in muscular reeducation. It would seem that unless the patients are treated by competent, trained workers, the end results may be found to be more favorable by the former use of splinting than by the Kenny system. Time and the accumulation of statistical data are needed before a definite answer is possible. It is my personal impression that the use of intensive heat and more frequent manipulation of the joints through their painless range of motion may result in more rapid relief of muscle tenderness and an increase in the range of motion in the joints.

If heat, as Miss Kenny suggests its use, relieves tenderness, and if the normal range of motion in the joint occurs soon, then a valuable addition to the treatment of infantile paralysis has been found. The orthopedic treatment for the acute phase of infantile paralysis, as it was previously practiced at the Betty Bacharach Home and in other such centers, gave very good results in a large percentage of cases. However, paralysis and deformity also occur in many. The answer to many questions in the Kenny system are as yet both incomplete and unsatisfactory, but many of the things Miss Kenny does are logical. Until a preventive or specific treatment has been found for infantile paralysis, some patients will recover completely and others will have more or less residual paralysis, regardless of the method of treatment or whether it is started immediately or soon after the onset of the illness.

It is the author's impression that the treatment of the acute phase of infantile paralysis, will, for the most part, revert to the previous methods used at the Betty Bacharach Home and will incorporate those measures suggested by Miss Kenny that have proved their value. In either system of treatment, however, the value can be measured only by the expertness and training of the people who give it.

The Early Treatment of Strains and Sprains by Graduated Muscular Contractions

Sir Morton Smart, K.C.V.O., D.S.O., M. D., Manipulative Surgeon to H. M. the King; Consultant to the London Clinic for Injuries. IN THE BRITISH JOURNAL OF PHYSICAL MEDICINE AND INDUSTRIAL HYGIENE, Vol. 6, No. 3, May-June 1943.

The importance of maintaining the physiological activity of muscles at its maximum in the treatment of strained muscles and sprained joints, particularly in the early stages, is in my experience of the greatest importance, particularly in these days when owing to the exigencies of war so many men and women are undergoing extensive training. Effective early treatment of minor strains and sprains, I am convinced, would do much to prevent changes in muscles and in joint structures.

Muscle tone, the all-important condition necessary for high efficiency in muscle action, may be defined as a muscle's state of attention in readiness to respond immediately to a physiological stimulus. A high state of muscle tone is dependent on three physiological properties of muscle being normal—elasticity, contractility and irritability.

As rest physiologically tends to reduce the rate and amount of circulating blood and lymph through the body tissues, it would appear to be logical to utilize muscle action as a means of assisting the natural processes of repair after injury.

The general effects of treatment of injured muscles and joints by electrical stimulation, which produces graduated and controlled contractions and relaxations, are briefly summarized: (1) Muscle elasticity, irritability and contractility are rapidly restored to normal. (2) A great increase of blood is brought to the muscles. (3) Waste tissue products are rapidly cleared away. (4) A large supply of oxygen and nourishment is brought to the injured part. (5) Rapid absorption of fluid and extravasated blood is actively promoted. (6) Beneficial chemical and physical changes after muscle activity takes place. (7) The movements of muscles and their tendons do not allow organization of lymph and thus the danger of adhesions is minimized. (8) The danger of the areolar

tissue losing the suppleness, pliability and flexibility so necessary for efficient joint action is diminished. (9) If, in the later stages of sprains, adhesions have formed in the muscles and periarticular tissues, the adherent surfaces are gently and gradually torn apart by causing increasingly powerful contractions of the muscles separately. (10) Muscles are prevented from wasting, particularly if treatment is given soon after the injury; muscles already wasted increase in bulk.

It should be borne in mind that although the method of arousing muscle activity by electrical stimulation is advocated, the moment when voluntary movements can be initiated and carried out is well understood, and such voluntary movements are encouraged, when practical. The author does not advocate the supplanting of voluntary movements by those of electrical stimulation for one moment longer than is necessary.

Many cases can be cited in which injury to the soft structures limits voluntary muscle contraction because of pain as well as structural damage. Such muscles can be given graduated contractions painlessly immediately after the injury resulting, at this early stage. It should be remembered also that in the later stages of injury, when muscles have become atonic and wasted, a point may be reached at which only limited muscle contraction can be initiated voluntarily. In such cases the beneficial effect of graduated contractions produced by electrical stimulation carried out on the lines of the technic described only has to be seen in order to bring full realization of the inestimable value of this method of muscle treatment.

The Future of Rehabilitation

Terry C. Foster, Research Agent, Vocational Rehabilitation Division, U. S. Office of Education, Washington, D. C. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 8, August 1943.

Few people are aware of the size of the problem of rehabilitation and its social and economic implications. There are in this country 8,000,000 people who have physical disability of such nature and degree that at some time in their lives it will cause them difficulty either in getting or in holding a job. Of these, 6,000,000 are normally in employment, but 2,000,000 for one reason or another are unemployed. Although some of the latter get back to work, additional persons drop permanently out of the labor market. The pool is kept at a fairly constant level from a number of sources: (1) from among those currently becoming disabled in industrial, automobile, home and other accidents and from disease and congenital causes; (2) from among young disabled persons who reach employment age, and (3) for the duration of the war from among those disabled as a result of military operations. The annual increment from these sources is now at the rate of well over a million persons per year.

Thus, the minimum job of a rehabilitation service in this country is the rehabilitation of a million persons—to say nothing of another million from among the 6,000,000 who are normally employed but who drop out for one reason or another, such as progression of their disability, further injury or the acquisition of chronic diseases and technologic changes in their jobs, and require rehabilitation in order to get back into employment. These 2,000,000 persons not only are not producing but are consuming approximately a billion dollars a year of the production efforts of others.

In the present manpower situation it is sheer folly not to make them employable and put them to work as quickly as possible. It is a part of the present and the immediate future of rehabilitation to do just that. The present program is wholly inadequate to the present task. It will be more so for the task ahead.

The present manpower shortage is compelling the employment of the handicapped, but the idea of using physical examinations, tests of aptitude, and personality inventories as a guide to putting the right man in the right job has not taken hold. This fact is resulting not only in the ineffective use of labor but in the injury and crippling of large numbers of urgently needed workers in our war production industries.

The author proposes that physical therapists and the workmen's compensation and rehabilitation officials appoint committees to decide on a program for working together on the different problems in which they have a common interest, including the strengthening of workmen's compensation and rehabilitation legislation.

Ultraviolet Lamps For Disinfecting Purposes

Council on Physical Therapy. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 123:2:92, Sept. 11, 1943.

Clinical evidence submitted to the Council on Physical Therapy shows that under properly controlled conditions the killing of air borne micro-organisms by ultraviolet rays may be used to supplement other methods of disinfecting air for prevention of cross infection in contagious wards, in nurseries and for reducing air borne infection of wounds in hospital operating rooms. Council acceptance is limited to ultravoilet disinfecting lamps designed for installation in hospital nurseries, hospital wards and operating rooms.

Satisfactory evidence is not available to warrant acceptance of ultraviolet lamps for disinfecting solids.

The total amount of direct and scattered ultraviolet radiation incident on the occupants must be kept below the level that will produce conjunctivitis, erythema and any other (at present unforeseen) injurious physiologic effects that may arise from prolonged irradiation. This requirement may be met by suitable arrangements of the lamp fixtures and baffles and not by requiring the applicants to wear glasses and special covering of exposed parts of the body (face, hands) normally uncovered.

Ultraviolet lamps for disinfecting purposes shall have under suitable ventilating conditions of a room a concentration of ozone not to exceed one part in ten million.

Prevention and Treatment of Infections of the Hand

Vinton E. Siler, M. D., Cincinnati, O. In THE JOURNAL OF THE INDIANA STATE MEDICAL ASSOCIATION, Vol. 36, No. 7, July 1943.

Industrial statistics, both in the United States and Canada, have shown that infections of the hand cause a greater loss of working days than any other single condition. During this great war program, when industrial activity has increased, when it is essential that industrial men and women work seven days a week twenty-four hours a day, there is a need to express some concern about the medical aspects of this situation.

It is impossible to discuss the management of infections of the hand without referring to Kanavel's excellent study from which evolved the basic, fundamental principles of the diagnosis and treatment of lesions of the hand. Much credit in this field must be given to Koch and Mason, not only for the propagation of Kanavel's ideas, but also for their clinical and experimental contributions which have been extremely helpful in the attack upon this problem.

Summary

Industrial statistics show that infections of the hand form the major injuries which lead to partial and permanent disabilities. An attempt has been made to review many of the factors in industry which, if corrected, would to a large extent aid in the prophylactic treatment of these infections. It has been shown that asepsis, avoidance of contamination, and avoidance of tissue damage are at least three factors which, if practiced, would reduce the occurrence of infection. Reemphasis has been placed upon the essential principles in the management of infections of the hand. Four types of infections of the hand have been discussed in order to outline specifically methods of approach. Since infections of the hand are costly in time and money to all concerned, it would seem worthwhile to utilize all principles to avoid these infections. Obviously, the best treatment is prevention, and prevention of infection cannot be accomplished by one man alone. Prophylaxis must be the result of cooperation and the sharing of responsibility by the employer, by the employee, and by the surgeon.

The Importance of Leaving a Good Amputation Stump

A. B. Lemesurier, M. B., Toronto, Ontario, Canada. In JOURNAL OF BONE AND JOINT SURGERY, XXV: 3:566, July 1943.

The usefulness of any amputation stump depends very largely upon how good that stump is when it is fitted with an artificial limb. With a good stump, the business of fitting an artificial limb is comparatively simple. With the limb on, a good stump is comfortable and can work the limb quite well, and, with a moderate amount of use, should remain comfortable and efficient for a good many years. Unfortunately, not all stumps are good ones. In a war it cannot be expected that all amputations will be done by experts, but any surgeon who is likely to have to do any amputations should have a pretty good idea of what constitutes a good stump and should know how to go about making one.

There is an interval between the time that the wound heals and the time that the man can wear an artificial limb. The dissection at the operation has been so extensive that it takes about a month before it is healed soundly enough to stand much pressure or much movement. Another reason is that after an amputation a stump always shrinks, rapidly for the first month and then more and more slowly. It is expensive to get a finished artificial limb until the shrinking has almost finished. The shrinking can be hastened best by the use of a crepe bandage which is applied evenly and fairly firmly, and which exerts, as much as possible, pressure from below upward. The proper application of this pressure bandage requires a fair amount of skill, but in the lower limb the patient can learn to do it himself fairly well. The bandage should be changed two or three times a day, when it becomes too loose or too tight, and should be worn the whole twenty-four hours. The temporary limbs are not of much use in the upper extremity or in below-knee amputations; in the latter case they are not so successful as the bandaging. In high amputations, the author believes they are good, but in these, the buckets, usually made of plaster, should be made carefully and should be of much the same shape as the permanent bucket. He thinks, too, that it is a mistake to wait until the shrinking is entirely finished before supplying a complete limb. With adequate bandaging, most of the shrinking has taken place in three months after the wound has healed, and a complete limb then usually can be worn quite well. It is true that further shrinking probably will make another bucket or another leg necessary in about three months, but getting the man back to work sooner justifies the additional expense. While waiting for the shrinking to occur, the man should systematically exercise the muscles that control the stump, and when he gets his artificial limb he should be carefully instructed in its use.

Present Status of Therapeutic Hypothermy

Max Karl Newman, M. D., Detroit, Mich. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 7, July 1943.

An unusual heightening of scientific interest now is apparent in the use of cold in therapeutic procedures. Except in empiric fever observation, there has been little or no thought given to low temperature physiology. When general crymotherapy in cancer was being investigated, only a few thoroughly scientific physiologic studies were made. Common to all was the observation that low temperatures always were anesthetic, thus relieving pain and controlling local inflammatory reactions.

During the past ten years extensive investigation has been carried out on the effects of temperature and its influence on the survival of damaged tissue.

Use of Cold as Preoperative Anesthetic

Cold as an anesthetic acts directly on the cells of the body, reducing the metabolism to a minimum. Tis-

sue cells in muscles, nerves and organs have their protoplasmic activity depressed and their oxygen needs reduced and so are able to exist for long periods in anoxic surroundings.

In all phases of trauma associated with war, hypothermic anesthesia aids in control of hemorrhage, infection, progressive shock and pain and prepares for amputation if needed. Compound fractures associated with infection, severe burns of the extremities, crushing injuries of the soft tissues and the like in industrial accidents can be controlled readily by low temperatures.

Use of Cold in Peripheral Vascular Disease

Acute circulatory accidents with thrombosis and embolism can be controlled by the application of local cold. The immediate anoxia, rendering the damaged extremity liable to tissue necrosis and gangrene, becomes less dangerous. Combined with the use of heparin and dicoumarin, local cooling offers the patient a considerably increased chance of surviving.

Use of Cold in Immersion Foot and Frostbite

Webster and associates described 142 cases of immersion foot caused by long immersion of the extremities in cold water. Treatment consisted of elevation of the extremities and the application of cold. Dry cooling was accomplished by the application of ice bags, changed every four hours, and dry cooling by exposure to a fan, occasionally enhanced by nebulized cold water or exposure to room temperature in a cool room. A few hours after cooling relief of pain occurred. Edema subsided, and all blebs containing straw-colored fluid and blood were restored.

The author has shown that an attempt has been made to indicate the physiologic principles and the clinical observations inherent in the application of cold. Its use in preoperative anesthesia, peripheral vascular disease, immersion foot and frostbite, burns and shock is discussed. Cooling lowers the metabolism of the part, prevents the absorption of toxin and advance of bacterial infection, relieves pain and prevents thrombosis and embolism.

Principles of Exercise Therapy

Ernest A. Nicoll, M. D., Surgical Director, Accident Service, Mansfield General Hospital; Surgeon-in-Charge, Miners' Rehabilitation Center, Barry Hill Hall, London. In BRITISH MEDICAL JOURNAL, June 19, 1943.

Remedial exercises have long been recognized as the basis of functional recovery in fractures and other injuries of the locomotor system. In fact, the success of any accident service depends very largely upon its organization for the application of therapeutic exercise to all cases and at all stages. In nearly all prolonged or serious illness, however, both medical and surgical, and nontraumatic as well as traumatic, there is a general deterioration of the locomotor system, and this is the chief cause of incapacity during the convalescent stage. In the past, convalescence from these conditions has been entirely negative and loosely supervised, but efforts are now being made by the Ministry of Health to substitute a more positive approach on the lines of the aftercare organization in accident services. This, it is hoped, will be brought about by the more extended use of therapeutic exercise, on both a prophylactic and curative basis.

Two conditions, however, are essential to success. First, organization is necessary. The benefits of exercise therapy must be brought to all cases at the right time, in the right dosage, and in the appropriate form. Secondly, the physicians and surgeons themselves must appreciate and understand the basic principles of exercise therapy: for only then can they be expected to direct its application and to supervise intelligently the work of their technical assistants—the physical therapist, the occupational therapist, and the gymnast.

Summary

The basic principles of exercise therapy include the following five requirements: (1) Exercises must be both focal and general. (2) They must be administered with due regard to correct dosage. This is variable from case to case and at different stages in the same case. (3) They must be rhythmic in character. (4) They must be progressive in range, power, and time. (5) They must be variable in form, the chief forms being gymnastic, occupational, and recreational.

It is considered that a knowledge of these principles is all that is required or can be expected of the surgeon or physician who has incorporated exercise therapy into his system of treatment. The detailed application and elaboration of principles is the province of the technical assistants in the various forms of exercise therapy.

The Physical Therapy of Peripheral Vascular Disease

Harry Warshawsky, M. D., Veterans' Administration, White River Junction, Vt., and Mary W. Dempsey, Chief Aide, Physical Therapy, Veterans' Administration, Pittsburgh, Penna. In ARCHIVES OF PHYSICAL THERAPY, Vol. XXIV, No. 8, August 1943.

It is axiomatic that by mechanical means alone it is impossible successfully to treat diseases of the arteries. Physical therapy is but one of the conservative approaches to this problem. Medical management is of equal importance. Surgery, too, in its minor phases, has its indications in this field. As important as the realization of the limitation of physical measures is appreciation of the fact that, fundamentally, this group of diseases can be classified into two broad categories—functional and organic. The therapeutic management varies greatly in these two groups. In the functional types the goal is to overcome vasospasm or vasodilatation, as the case may be; while in the organic types the treatment aim is to repair the organic insult of the arterial pathways and to foster the development of collateral channels.

The authors came to the following conclusions:

1. The importance of accurate diagnosis, proper selection of cases for the particular type of treat-

ment, and correlation of physical, medical and surgical methods of management in peripheral vascular diseases is stressed.

2. Intermittent venous occlusion, in our experience, has been the most valuable of the three methods of mechanotherapy in allaying symptoms and healing open lesions.

3. The suction and pressure method still plays an important role in this field.

4. A program of intensive therapy, regardless of which modality is used, is important in principle.

Book Reviews

YOUR ARTHRITIS: WHAT YOU CAN DO ABOUT IT. By Alfred E. Phelps, M. D. Introduction by R. Garfield Snyder, M. D. Cloth. Price, $2. *Pp.* 192, *with* 12 *illustrations. New York: Wm. Morrow & Co., Inc.,* 1943.

The author, for the past seven years, has been associated with the Hospital for Special Surgery in New York City. Snyder, who wrote the introduction is Chief of the Arthritis Clinic of the Hospital for Special Surgery. After reading this book we can agree with Snyder when he says: "I wish to assure the reader that all the scientific statements are accurate and reliable. The views expressed on the subject of arthritis and its treatment on the whole represent the concensus of opinion of the leading rheumatologists in this country."

The author in his chapter, "The Doctor Prescribes," emphasizes and describes the use of physical agents as accessory treatment. The chapter on "Posture and Gait, Their Importance" starts with a statement that everyone should remember. "The common greeting in France should be of special interest to those of any nationality who suffer from arthritis. 'Comment vous portez vous. . . . How do you carry yourself?' There's a world of scientific wisdom in the remark."

This book can be recommended for two reasons: It tells the patient how to cooperate with his physician while under treatment. It helps the busy physician who has little time, especially in these days, to go into detail with the patient on all the little things he can do at home, in his work and in his recreation hours to get the most out of life within the limitations of his disease.

QUESTIONS AND ANSWERS, VOLUME 2. The *Questions and Answers in This Book Have Been Selected from Those Published in The Journal of the American Medical Association, Department of Queries and Minor Notes in* 1940, 1941 *and* 1942. *Cloth. Price,* $2. *Pp.* 449. *Chicago: American Medical Association,* 1942.

This is the second volume of a selected list of answers to queries sent to the Journal of the American gery. The answers here published have been prepared by competent authorities. This book should be Medical Association. There are thirty-nine chapters covering most of the subjects in medicine and surin every medical library.

DISEASES OF THE SKIN. By Oliver S. Ormsby, M. D., Ruth Professor of Dermatology, University of Illinois; Attending Dermatologist to the Presbyterian Hospital of Chicago, and Hamilton Montgomery, M.D., M.S., Associate Professor of Dermatology and Syphilology, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota, Rochester, Minnesota. Sixth edition. Cloth. Price, $14. *Pp.* 1360, *with* 729 *illustrations. Philadelphia: Lea & Febiger,* 1943.

In this volume the authors first devote several chapters to subjects of vital interest to the student of dermatology which they rightly believe will materially simplify the study of individual diseases. Without a good working knowledge of the microscopic anatomy and physiology of the skin, an understanding of the pathological changes which occur in disease is rendered more difficult.

The diseases of the skin are grouped in this work in the following classes: hyperemias and inflammations; hemorrhages; hypertrophies; atrophies; pigmentary affections; diseases of metabolism, neoplasms, chronic specific inflammations; neuroses; parasitic affections and diseases of the appendages.

This is the sixth edition of this popular book. Since the publication of the last edition much investigative work has been done in dermatology. In order to incorporate this material and still maintain a book of reasonable size the authors have regrouped a large number of diseases; added two new classes, eliminated much material rendered obsolete through recent discoveries, added twenty-two diseases not previously described in the text and rewritten many others.

There is no need to discuss this book in detail. The general practitioner or the medical student who wishes to study diseases of the skin will find here a masterful and easily read description of these diseases.

ESSENTIALS OF INDUSTRIAL HEALTH. By C. O. Sappington, M. D., Dr. P. H., Consulting Industrial Hygienist, President of Central States Society of Industrial Medicine and Surgery, Editor of "Industrial Medicine." Cloth. Price, $6.50. *Pp.* 626, *with* 63 *illustrations. Philadelphia: J. B. Lippincott Company,* 1943.

The health of the industrial worker in this World War has become as important as the health of the soldier. This, therefore, is an important book. The author shows that industrial health goes beyond the ordinary practice of curative medicine and surgery in industry, into economics and sociology, industrial hygiene and toxicology, sanitation, health, nutrition, housing, recreation, fatigue control, mental hygiene, vital statistics, codes, regulations, factory inspection, adaptation of the worker to the job through job analysis, aptitude tests, psychologic tests, consideration of the significance of industrial accidents, occupational diseases, nonoccupational disability, workmen's compensation disability and rehabilitation.

Every physician concerned with industry should read this book.

HOW TO KEEP FIT AND LIKE IT: A MANUAL FOR CIVILIANS AND A PLAN FOR COMMUNITY APPROACH TO PHYSICAL FITNESS. By Arthur H. Steinhaus, Ph. D., M.P.E., Professor of Physiology, George Williams College; Alma M. Hawkins, A.M., Assistant Professor of Hygiene and Physical Education, George Williams College; Lt. Comdr. Charles D. Giauque, U.S.N.R., formerly Professor of Health and Physical Education, George Williams College, and Edward C. Thomas, B.S., Physical Director, South Chicago Y.M.C.A., Chicago. Illustrated by Lea Waterman. Paper. Price, 25 cents. Pp. 64, with illustrations. Chicago: Basic Books, Inc., 1943.

This small booklet gives the best facts and practices of physical fitness. It can be recommended as a manual for civilians and a plan for a community approach to physical fitness.

RELAXATION. By Josephine L. Rathbone, Associate Professor of Physical Education, Teachers College, Columbia University. Cloth. Price, $1.75. *Pp.* 157. *New York: Bureau of Publications, Teachers College, Columbia University,* 1943.

This book explains the physiologic as well as the psychologic causes of extreme fatigue and disturbing tension, and describes how these causes may be counteracted or dispelled. Those for whom the suggestions are made are described in this monograph. They come from many walks of life, but they have certain qualities in common. They are enterprising. Some of them are students. Often they have such deep concentration on work and so much eagerness to achieve that they disregard the vehicles through which their ends are accomplished. The majority of those who will find guidance from this book will be conscientious toilers in the professions, harassed business men and women, hectic industrial managers and skilled workers in industry. Any individual who is carrying burdens and experiencing tensions for which he needs technics in relaxation will find this book most valuable.

This book is concerned with relaxation as an aid in total fitness, not with other aspects of general hygiene. The emphasis is placed upon ways of offsetting and releasing tenseness, and not directly upon stamina and vitality. Too few teachers, professional workers and leaders in business and industry are sufficiently concerned about stability and serenity as means of offsetting psychological breakdowns and, indirectly, increasing stamina and vitality. The author gives suggestions on how to prevent collapse of the psychological organism, not on how to drive it to the limits.

Rathbone describes the physical and psychological treatment for increased tension. She believes that it is possible to reduce tension and bring about relaxation by rhythmic exercises for the extremities and trunk; by devices to encourage greater flexibility in all joints, but particularly in the spine and chest; thereby facilitating better functioning of the diaphragm; and by concentrating the attention upon reducing tonic contraction in localized muscles. The Jacobson technic is described also.

Under psychological treatment the author shows how to be vigorous, when vigor is in order, by using resources of energy which have been acquired through storage during periods of repose and release from previous struggles. The creative, satisfying life calls for periods of relaxation and complete recuperation from effort and strain, alternating with periods of powerful output of mental as well as physical effort. The author rightly believes that it is only in this sense that one desires to acquire ability to relax—as a preparation for more dynamic outputs of effort. One gains strength through struggle, and one gains strength through repose.

This is an outstanding monograph on relaxation and should be read by everyone.

PHYSIOLOGICAL REGULATIONS: HOW ORGANISMS MAINTAIN THEIR CONSTANT FUNCTIONS. By Edward F. Adolph, Associate Professor of Physiology, School of Medicine, University of Rochester. Cloth. Price, $7.50. *Pp.* 502, *with illustrations. Lancaster, Penna.: The Jaques Cattell Press,* 1943.

This is a book that will be read eagerly by the physiologist and the physician who is interested primarily in research. It will appeal particularly to those interested in internal medicine. It is not a book, however, that will be of great interest to the average physician. The author states he describes interrelations among a limited number of rather familiar facts. He presents numerical data and then a generalization from them. An excellent summary follows each chapter and for those who are content to take their facts on faith, a reading of the summary will avoid labor which they might find tedious.

Living organisms are much the same day after day both in form and function. This constancy represents a physiological regulation. Regulations, in physiological science, mean those self-managements of organisms which result in constancy of function. It represents the vague realization that the normal state of the organism is maintained by specific processes which resist change. The author states that the plan of his investigation is the equivalent of an interweaving of at least five studies: (1) water exchanges in animals; (2) rates of certain classes of physiological processes; (3) quantitative comparison of like functions in diverse species and individuals; (4) organ and tissue exchanges, and (5) components, similarities and contrasts in their metabolisms and economies. Some of the subjects presented and discussed are: water metabolism of man; tolerance curves; stationary states in organisms; variabilities of organisms; recovery processes; signs of disturbance and disease; interacting maintenances; temperature regulations; selection of environments; units; and blood volumes. The subject matter is storage and depots; cells and tissues as regulated well and logically presented and profusely illustrated.

METHODS FOR THE STUDY OF PERSONALITY IN YOUNG CHILDREN. Edited by Eugene Lerner and Lois Barclay Murphy. Vol. VI, Serial No. 30, No. 4, Monographs of the Society for Research in Child Development. Paper. Price, $2. Pp. 289. Washington, D. C.: National Research Council, 1941.

This monograph is a very adequate presentation for the study of psychological reactions such as in the stimulus response situations. It attains an objective means of study of subjects projected by stimuli. It also contains the implication that the subject creates his own stimulus or characteristic response. These technics avoid the older ideas of exact quantitative measures and favors sensitivity and qualitative discrimination.

The methods described range from careful observations of children in the nursery school to extremely systematic series of experimental stimuli to provoke emotional response in children. The latter have as their goal effective removal of repressions to allow a more friendly expression of responses.

This study may be adequate from an academic point of view but really is not productive of emotional material that would greatly facilitate clinical psychiatric examination and therapy in the character neuroses or psychosomatic illnesses. The technics described in play diagnosis and therapy are definitely advantageous in children but are better described in many other publications where the interrelationships with the adult emotional problems in the parents are more adequately protrayed, i.e., stress would be better placed on colloborative psychotherapy in children and their parents.

THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE. A UNIVERSITY OF TORONTO TEXT IN APPLIED PHYSIOLOGY. By Charles Herbert Best, M. A., M.D., D. Sc. (London), F.R.C., F.R.C.P., (Canada), Professor and Head of Department of Physiology, Associate Director of the Connaught Laboratories, Research Associate in the Banting-Best Department of Medical Research, University of Toronto, and Norman Burke Taylor, M.D., F.R.S. (Canada), M.R.C.S., (Eng.), L.R.C.P. (Lond.), Professor of Physiology, University of Toronto. Third Edition. Cloth. Pp. 1942, with 497 illustrations. Price, $10. Balitmore: Wiliams and Wilkins Company, 1943.

This is the most popular textbook of physiology yet written. This third edition, published in March 1943, had to be reprinted in June. The authors have correlated physiology and clinical medicine in such a way that physiology becomes a real living science. While much of the material has been presented in the previous editions, it has been revised to include many new concepts which the war situation has introduced. The section on intracellular respiration, respiratory enzymes and energy liberation has been entirely rewritten. Many chapters have been revised with the result that the authors have once again produced an authoritative and up-to-the-minute textbook. There are nine sections, divided into eighty-one chapters. Section one discusses the blood and lymph; section two, the circulation of the blood; section three, respiration; section four, the excretion of urine; section five, digestion; section six, metabolism and nutrition; section seven, the ductless glands or endocrines; section eight, the nervous system, and section nine, the special senses.

This book also has an excellent eighty-seven page section of references. There are many new and original illustrations. Every practicing physician should have this book in his library. It is a "must" book. It should serve as an excellent textbook for the schools of physical therapy that have been organized within the last few years. This text is highly recommended for physicians, medical students, physical therapy technicians, and to all those who wish to keep abreast of the rapidly moving facts and theories of applied physiology.

FIRST AID: SURGICAL AND MEDICAL. By Warren H. Cole, M. D., F.A.C.S., Professor and Head of the Department of Surgery, University of Illinois College of Medicine, Chicago, and Lieutenant Colonel Charles B. Puestow, Medical Corps, Army of the United States. Second edition. Fabrikoid. Price, $3. Pp. 351, with 92 illustrations. New York & London: D. Appleton-Century Company, Inc., 1943.

This is the best book on first aid that has been published. Its value can be appreciated when it is realized that a second edition was necessary within a year after the first edition. The authors and contributing authors all are authorities in the fields about which they write and are on the teaching staff of the University of Illinois College of Medicine.

The new material in this edition increases the usefulness of this book to the medical personnel of the armed forces and of civilian defense. The color chart of chemical warfare agents which is included in this book has been revised by and reproduced through the courtesy of the Chemical Warfare Service of the War Department.

This volume is highly recommended to all medical students and physicians..

FRACTURES AND DISLOCATIONS. By Various Authors. Edited by Sir Humphry Rolleston, Bt., G. C.V.O., M.D., and Alan Moncrieff, M. D., F.R.C.P. Cloth. Price, 7s. 6d. Pp. 104, with 25 illustrations. London: "The Practitioner" in conjunction with Eyre & Spottiswoode, 1943.

This is one of the series entitled "Practitioner Booklets." Six of the articles in this volume were published first in June 1940 in the "Practitioner" in a symposium on fractures and dislocations. Two of the articles on head injuries and spinal injuries were published previously. The authors have carefully and completely revised their articles so this booklet now represents, in short form, an account of the diagnosis and treatment of the chief fractures and dislocations.

DISEASES OF THE NOSE, THROAT AND EAR. MEDICAL AND SURGICAL. By William Lincoln Ballenger, M. D., F.A.C.S., Late Professor and Head of the Department of Otology, Rhinology and Laryngology, School of Medicine, University of Illinois, Chicago, and Howard Charles Ballenger, M. D., F.A.C.S., Associate Professor of Otolaryngology, Northwestern University School of Medicine, Chicago; Surgeon, Department of Otolaryngology, Evanston Hospital, Evanston, Illinois. Eighth edition. Price, $12. Pp. 975, with 631 illustrations. Philadelphia: Lea & Febiger, 1943.

This excellent book on diseases of the nose, throat and ear is divided into five parts: the nose and accessory sinuses; the pharynx and fauces; diseases of the larynx; the ear; and bronchoscopy. This edition is thoroughly revised by rearrangement, partial rewriting, amplification of certain portions of the text and elimination of obsolete matter. The illustrations are excellent and new ones have been added.

Dr. Leroy A. Schall, Chief of Staff of Otolaryngology of the Massachusetts Eye and Ear Infirmary furnished the material from which the new photomicrographs were made. Some of the specimens of the internal ear were obtained from the personal files of Dr. M. H. Lurie. Dr. John J. Ballenger revised the chapter on paralysis and neurosis of the larynx. Dr. J. D. Kelly gives the technic of his arytenoidectomy for bilateral paralysis of the recurrent laryngeal nerves.

Part five on bronchoscopy is written by Gabriel Tucker, M. D., Professor of Laryngeal Surgery, Graduate School of Medicine and Professor of Clinical Bronchoscopy and Esophagoscopy, School of Medicine, University of Pennsylvania and Chevalier L. Jackson, A.B., M.D., Professor of Clinical Bronchoscopy and Esophagoscopy, Temple University School of Medicine.

There is a short chapter on physical therapy in otolaryngology. This gives a true picture of what we know of the use of thermal therapy, infra-red rays, ultraviolet rays, medical and surgical diathermy and ionization in the treatment of diseases of the nose, throat and ear.

This is an easily read book and excellently illustrated. It can be highly recommended to the medical student and the general practitioner as a complete text on this subject. It can be recommended to physical therapists as a reference book giving conservative views on the use of physical agents in otolaryngology.

Books Received

THE EPIDEMIOLOGY OF DIPHTHERIA DURING THE LAST FORTY YEARS. By W. T. Russell. Privy Council of the Medical Research Council, Special Report Series, No. 247. Paper. Price, 1 s. Pp. 52. New York: British Information Services, 1943.

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